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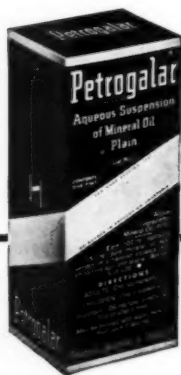
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Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26

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Tel. 69

Minnesota Medicine

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TUBERCULOSIS OF THE EYE

F. H. HAESSLER, M.D.

Milwaukee, Wisconsin

HOWEVER alluring the many theoretical problems are, for the practicing oculist, the central problems of tuberculosis are diagnosis and therapy. The two functions expected of a physician are that he give his patient reliable advice and, where possible; institute such measures as will beneficially influence the course of the disease. In tuberculosis it is of particular importance that the fundamental reactions be understood because an etiological diagnosis is of importance. It is on the basis of such diagnosis that *specific therapy* can be instituted.

The diagnosis of tuberculosis of an eye is never completely certain. It is always a diagnosis of probability, and it must be admitted that the prejudices of the individual diagnostician play a part in the decision. This makes it impossible to arrange reliable statistics as to the occurrence of tuberculosis of the eye. Some German clinics classify over one-half of their cases of uveitis as tuberculosis, while some American workers whose attention is centered on focal infections find no more than 5 per cent. The diagnosis is based on four kinds of data, namely:

1. An understanding of the reactions and the change of reaction in tissue in general produced by tuberculous infections.
2. The characteristics of eye lesions which previous clinical and pathological experiences have shown to be tuberculous.
3. Evidence that the patient has been infected with tuberculosis as is shown by reactions

to the injections of tuberculin and by the presence of tuberculosis in other organs.

4. The inability to demonstrate another etiology.

When tubercle bacilli first invade a body, they cause an inflammatory reaction or tubercle formation at the site of invasion and are also disseminated to the regional lymph-nodes. In most cases the portal of entry is the lung, and the primary complex involves pulmonary tissue and the tracheobronchial lymph-nodes. Other organs may also be the seat of primary infection: for example, the intestine or the conjunctiva. The latter is rare but is occasionally seen as a unilateral ulcerated conjunctival nodule with swelling of the preauricular lymph-node almost always in young patients. The primary reaction is probably stimulated by the lipoid fraction of the tubercle bacillus body. Wherever introduced into a hitherto uninfected body, the tissue reacts either with inflammation or tubercle formation. It is the relative number of bacilli and the site of their lodgment that determines which of these reactions takes place.

From this primary complex, tubercle bacilli may be transferred to other parts of the body. In most instances the secondary infection is spread by way of the blood. This is true even of the choroidal lesions accompanying tuberculous meningitis. Much more rarely is the infection spread by the lymphatics or by direct extension from contiguous structures. The nature of the secondary lesion depends not only on the site

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of the metastatic lesion but on the reaction of this tissue. The reaction of the secondarily invaded tissues differs from that at the site of the primary complex because the changes take place in the tissues of the host in the weeks that follow primary invasion by tubercle bacilli. The tissues become hypersensitive or allergic and an immunity develops which is a mechanism consisting of several factors not completely understood which bring about increased resistance to the bacillus.

The allergy is a characteristic reaction of the human body to all foreign protein of whatever nature. As a result of primary infection, the tissues of the host become allergic to the tubercle bacillus protein. This tuberculo-protein or antigen combines with the allergic antibody which is produced in the tissue cells—not the body fluids—to form a necrotizing poison. Everything that happens at the site of an uncomplicated allergic reaction is merely the standard reaction of the body to a chemical irritant. With properly adjusted concentrations, it would be possible to produce with sulphuric acid a lesion indistinguishable histologically from antigen antibody inflammations. It causes cellular damage and may seriously impair healing. It is also largely responsible for the inflammatory reaction which is largely a vascular reaction. Allergy does not, however, induce tubercle formation. That is a response to the lipid of the bacillus. Tubercle formation requires no inflammatory paralysis of vascular walls for its evolution. It is the most primitive organized reaction to an invading organism and can occur in animals that have no vascular system. Tubercles can form independently of blood vessels in any tissue to which mononuclear phagocytes have access—even in vitro in tissue cultures.

The other change produced by primary invasion of the host is immunity. That is a complex reaction which consists of a number of factors which tend to fix the bacilli near the site of invasion, to limit their spread, and to inhibit their growth so that repair may take place in the tissue of the host. The repair may result in complete destruction of the invader, and restitution of the invaded tissue to its normal state or more often an encapsulation of an infected area by a thick fibrous coating which protects surrounding tissues from invasion.

The two mechanisms, allergy and immunity,

are separate entities, and allergy plays no part in immunity. It is doubtful that allergy even helps fix the bacilli at the site of invasion. This is accomplished by a specific precipitin-like mechanism which is part of the immunity reaction. When allergic inflammation occurs about a quiescent focus, there is a marked tendency to spread rather than to immobilization. The allergic reaction may also destroy newly-formed granulation tissue and so hinder rather than help the healing process.

Allergy seems unrelated to immunity. It can easily be produced as a response to the injection of dead tubercle bacilli or tubercle bacillus protein alone while immunity develops only as a response to the introduction of living tubercle bacilli. In the course of time the allergy wanes, and after the lapse of months following the injection of antigen, disappears. Despite the absence of allergy, however, such animals are found to be highly immune. In animal experiments, the criteria of allergy are reactions to injections of antigen: immunity is judged by survival time of the animal.

Allergy and immunity are the two important factors which determine the nature of all secondary or metastatic tuberculous lesions. Each may vary in quantity. A high degree of allergy or hypersensitivity makes a lesion highly inflamed and exudative, breaks down new-formed granulation tissue and hinders healing. Immunity inhibits the growth of tubercle bacilli, and prevents their spread, and allows reparative processes to proceed.

A host with high allergy and low immunity has the most malignant form of progressive inflammatory destructive and exudative tuberculosis. It is the type most dangerous to treat with tuberculin. On the other hand, low allergy and high immunity produces benign, torpid, productive fibrotic lesions with a tendency to heal. All possible quantitative combinations of these two factors may occur and produce the innumerable clinical manifestations of tuberculosis. There are, of course, other factors, some probably unknown and others well known, such as the number and virulence of the infecting bacilli.

In the young, when metastases occur soon after primary infection and before the host has become highly allergic, one often finds discrete tubercles with little inflammatory reaction. The less marked the inflammatory aspect of the le-

sion, the better the prognosis. In somewhat older patients who have become highly allergic, the lesions are characterized by severe inflammation and copious plastic exudation. The whole posterior surface of the cornea may become covered with mutton-fat deposits. The tuberculosis, usually uveitis, which begins later in life, say after forty, is usually free from marked congestion. The patients come for slowly progressive failing of vision, not redness or pain in the eye and strikingly the great majority are women.

Type of Lesion

Any structure of the eye may become the seat of a tuberculous lesion, but in the overwhelming majority of cases it is the uvea. This preponderance is so great that all other tuberculous lesions of the eye seem rareties. Tuberculosis has a special predilection for vascular and connective tissue, hence the uvea is the tissue first involved. From here it may spread to other tissues of the eye.

The conjunctiva may be the seat of a primary form of exogenous infection. This is a unilateral ulcerous nodule accompanied by swelling of the preauricular gland.

Secondary conjunctival tuberculosis may take the form of a proliferative lesion of granulation tissue which may ulcerate or not, and occasionally becomes manifest as a tumor-like tuberculoma. In contrast to other forms of episcleritis, such tubercles are indolent. They do not ulcerate, and if they heal at all, do so without loss of substance. Differentiation from other nodular lesions such as aphthemia nodosa, vernal catarrh, and others is not always possible and biopsy is advisable.

The corneal lesions are probably always extensions from a metastatic uveal lesion. Sometimes extension is direct and sometimes by rupture of a tubercle into the anterior chamber or Schlemm's canal. The clinical picture is not pathognomic. Suggestive is the marginal distribution and anterior position of the infiltrated areas. They tend to heal and to recur. A deep central infiltrate is sometimes observed and is believed to result from aqueous infection. Direct extension from the sclera produces sclerosing keratitis.

Deep scleritis is characteristically tuberculous. It is extremely resistant to treatment, protracted in course, and is apt to recur. The weakened sclera may bulge. Histological preparations are characterized by typical tubercle formations.

Uveal tuberculosis is so much the most common manifestation of the disease that ocular tuberculosis means uveitis to many. When actual tubercles are visible or the equally characteristic evanescent semi-transparent Koepe nodules on the pupillary margin, the diagnosis does not present much difficulty. When the iritis is diffuse, an etiological diagnosis is less obvious, often difficult and frequently impossible. When the exudate is serous and is characterized by cells or cell clumps in the aqueous and well-formed cell masses floating in the convection current in the aqueous or deposited on the post corneal surface, most characteristically in the lower quadrant, a diagnosis of tuberculosis, syphilis, or sympathetic ophthalmia suggests itself. Absence of preceding trauma and a negative Wassermann reaction make tuberculosis a likely diagnosis. When the exudate is fibrinous, the aqueous is also characterized by freely floating cells, but they soon become entangled in a fibrinous network and all orderly movements stop. Efflorescences on the pupillary margin are never seen in this type. The stroma becomes swollen, hyperemic, and hemorrhagic and eventually hypopyon and hyphema develop. This is the picture associated with acute iritis whose etiology seems most often to be focal infection or gonorrhea.

Unfortunately these clinical pictures are only suggestive of certain etiological factors and by no means pathognomic. It must be emphasized that the eye may respond to the stimuli produced by tuberculous infection in a multitude of ways and even the most stormy course does not rule out tuberculosis.

Before the observation of von Michel it was thought that only those ocular inflammations associated with visible nodules could be called tuberculous. He recognized the fact that an iris which was clinically free from nodules might still show typical miliary tubercles histologically. In this country Verhoeff reported a case of iritis whose chief characteristic was acute fibrinous exudate without any nodules. Tuberculosis was not even suspected until typical tubercles were seen in the histological preparations made from the eye after it was enucleated for pain. He has collected several similar instances and other observers have corroborated these findings.

Similar observations can be made in the choroid. The nodular lesion immediately sug-

gests a tuberculous etiology, while in the case of diffuse and exudative lesions, this etiology is less readily suspected.

In the retina the characteristic tuberculous lesion is the syndrome known as recurrent juvenile vitreous hemorrhage. If the hemorrhage is small so that the fundus is visible, one frequently sees localized opacities associated with the retinal veins which are the clinical expression of tubercles in the venous wall. This has until recently been considered a disease *sui generis*. It has been rather generally believed to be a manifestation of tuberculosis although even this has been doubted by Marchesani who believes many cases of retinal periphlebitis to be part of generalized endarteritis. The recent work of Meyer, however, based on histological study of an unusually large number of eyes makes it clear that the disease is in most instances tuberculous. Furthermore, he demonstrated that it is not usually an isolated disease but in the majority of cases an extension of an uveitis which had not been clinically manifest. Most often the uveitis precedes the periphlebitis but the opposite may be true. There is no essential difference between the isolated periphlebitis and one consecutive to iridocyclitis. Clinically the only difference is that the former is more often associated with hemorrhage. Ophthalmoscopically the pictures are identical when not obscured by hemorrhage.

The substratum of the clinical mantle about the veins is an infiltration of the perivascular lymph sheath with lymphocytes. The infiltration consists for the most part of round cells only very occasionally of specifically tuberculous granulation tissue. The process is often accompanied by proliferation of the cells of the vascular wall so that the lumen is obliterated, which is followed by the formation of new vessels which become clinically visible. Many transitions are found between these infiltrates and tubercle in the nervous tissue.

The tuberculosis is partly transmitted from the anterior uvea by means of the lymphatic circulation in the perivascular lymph sheaths which surround the blood vessels of the retina which have no other lymphatics. Infection has also been observed to arise by direct perforation of a choroidal tubercle which may be followed by numerous superficial tubercles on the inner surface of the retina from dissemination on the

vitreous. Direct hematogenous infection of the retina is also possible.

Relation of Ocular Tuberculosis to Tuberculosis Elsewhere

Since ocular tuberculosis is a secondary infection, there are two points on which a general examination can give diagnostic aid. It can sometimes find the seat of the primary lesion and even uncover evidence that it is active in giving off bacilli. When this is not possible, a positive intradermal tuberculin reaction can at least demonstrate that the patient has in his body living or recently dead tubercle bacilli that are responsible for his sensitivity to tuberculo-protein. In absence of this, an etiological diagnosis of tuberculosis has little support.

The consensus of opinion among ocular tuberculographers is that it is probable that the primary lesion for most ocular tuberculosis is intrathoracic, specifically hilus gland tuberculosis. Physical examination and refined roentgenograms give very reliable information about these lesions. Since the bacilli are frequently disseminated from a lymph-node breaking through into a vein, they must pass through the pulmonary circulation before they again have access to the general circulation. One would expect to find metastatic lesions in the lung as well as in the eye in at least some of the patients. This has indeed been found to be true. Werdenberg has demonstrated roentgenograms which give evidence of miliary tubercles in the eye corresponding in age with the ocular lesion. In a study of 500 patients, Werdenberg found that roughly 60 per cent had mild intrathoracic tuberculosis associated with severe ocular tuberculosis; in 30 per cent the two lesions were equally seen, and in 10 per cent there was an inverse relationship; namely, the pulmonary disease was severe and the ocular lesion mild.

These findings must not be believed to be in disharmony with the statement based on experiences of many tuberculographers with thousands of patients, namely, that ocular metastasis is the greatest rarity in patients with severe progressive pulmonary disease. This progressive pulmonary disease is probably the result of exogenous reinfection. Patients whose immunity is kept at a high level by the escape into his bloodstream of a small number of bacilli from a lymph-node from time to time is able to cope

TUBERCULOSIS OF THE EYE—HAESSLER

with the reinfection. The patient with ocular metastasis is in this position.

The tuberculin reaction is a test of allergy or hypersensitivity. Since allergy wanes in the course of months unless it is kept at its level

of the infection has been recommending a product known as p.p.d. These letters are the initial letters of "purified protein derivative." It represents the protein extracted from cultures of strains of tubercle bacilli whose virulence and behavior are

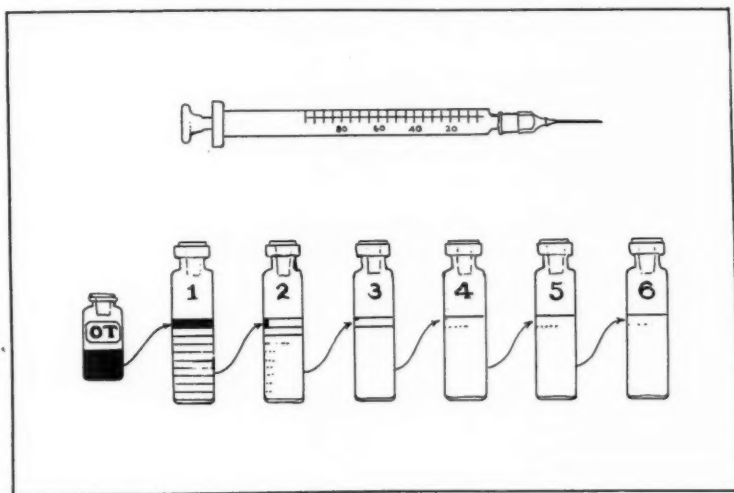


Diagram showing the entire equipment needed for therapy with tuberculin. One-tenth c.c. O.T. is taken from the purchased vial with a tuberculin syringe without removing its rubber stopper. This 1/10 c.c. O.T. is injected into another vial, through its rubber stopper containing 9/10 c.c. physiological salt solution. One-tenth c.c. of dilution No. 1 is injected into the next vial of the series to make dilution No. 2 (1/100 O.T.). The process is repeated serially.

by the introduction of new tuberculo-protein from bacilli in a lymph-node or other site of inflammation, a positive reaction is good evidence that the patient harbors tubercle bacilli. This tuberculosis may be inactive in an encapsulated lesion which is not a source of metastasis. If the test is negative it may mean that the patient has never been infected with tuberculosis, or long enough before the test so that allergy has waned, or so recently that allergy has not yet developed. This takes several weeks (four to eight) to occur. The test may also become negative in moribundi, febrile patients and after therapy with tuberculin.

In performing the tuberculin test, Koch's old tuberculin (O.T.) in dilution is commonly injected intradermally so that 1/1000 milligram O.T. is introduced into the skin. If this fails to cause hyperemia and edema, 1/100 milligram is injected and finally 1/10. One-tenth cubic centimeter of dilution, 1/100,000, 1/10,000, and 1/1000 respectively contain this amount of O.T. more recently the American Tuberculosis Asso-

well known and purified by means of a standardized chemical procedure. Its great advantage is absolute uniformity of the re-agent and, therefore, the production of comparable results for statistical analysis. The product is dispensed in tablets in which p.p.d. is incorporated in sterile lactose tablets in quantities of 0.0002 milligrams and 0.05 milligrams. The smallest dose detects a high percentage of total positive reactions with a minimum of severe reactions. The larger dose is designed for repeat tests on those whose reaction was negative with the smaller dose. The first dose is equivalent to one or two 1/1000 milligrams O.T., the second to 1 milligram O.T. The skin reaction has been classified:

+	some redness and edema between 5 and 10 millimeters in diameter
++	redness and edema between 10 and 20 millimeters in diameter
+++	redness and edema greater than 20 millimeters in diameter
++++	marked redness and edema and some necrosis.

When testing a patient who has an eye lesion that suggests high allergy or is in so vulnerable a tissue as the retina, it is wise to be more cautious in using the diagnostic tests and injecting only 1/100 cubic centimeter of the 1/100,000 dilution O.T. or the smaller dose of p.p.d. or even less than this. If negative, the test can be repeated with a larger dose.

Both the finding of the intrathoracic lesion of active tuberculosis and a positive tuberculin reaction do not prove that the eye lesion in question is tuberculous. They make such a diagnosis possible. When the eye lesion has characteristics which suggest tuberculosis, the diagnosis is still more probable.

A fourth point in the etiological diagnosis is the exclusion of other possible etiological factors if all factors other than tuberculosis can be excluded, the diagnosis becomes still more probable. It can only be made certain after the eye has been enucleated.

Among lesions which may most nearly simulate tuberculosis are syphilis and sympathetic ophthalmia. The latter need not be considered in the absence of antecedent trauma. A negative Wassermann excludes syphilis except in cases of interstitial keratitis and here other stigmata of congenital syphilis are diagnostic.

Non-tuberculous foci of infection form a large group of possible primary lesions. It is as difficult to establish their participation in the genesis of a secondary ocular infection as that of tuberculosis itself.

The most likely seat of a nontuberculous infection which may involve the eye is the prostate gland. Teeth and tonsils and other organs may also be suspected and if disease is found in them, proper treatment should be applied.

Treatment

The treatment of patients with tuberculosis of the eye should be managed with the cooperation of an internist. The patient is ill with tuberculosis, and the fact that the seat of the inflammation is the eye and not the lung makes it no less important to apply such general measures as diet, rest, heliotherapy, and other forms of stimulation as will increase his resistance to tuberculosis. Indeed, some patients with ocular tuberculosis do not improve until these general

measures are applied. Others get well with no other treatment than just such general measures. E. V. L. Brown reported his experience with four such patients. Many of the patients with ocular tuberculosis do indeed have an intrathoracic lesion as well which makes the internist's advice essential.

Such general measures as are used in the treatment of any other inflammatory disease of the eye are also indicated in tuberculosis—hot compresses, atropin, and nonspecific protein therapy. When all else fails, gold salts and roentgenotherapy are advised.

Most important to discuss, however, is the question of specific therapy with tuberculin. If one does not believe in its efficacy, there is hardly a logical reason for differentiating tuberculosis from the many other etiological factors which cause inflammation in the eye.

It must be emphasized that tuberculin can be harmful and extremely dangerous if it is improperly used. To use tuberculin intelligently, one must bear in mind its mode of action and the rationale of its application.

Tuberculin therapy may be used on the basis of one or both of two hypotheses.

1. It may desensitize the individual.
2. It may increase his local immunity about the focus of tuberculosis in the eye.

The process of desensitization is brought about by repeated injections of small doses of tuberculin, so small that one never produces a local or general reaction of any kind. The purpose of this mode of application is to reduce the patient's allergy to tuberculo-protein. In highly allergic patients, the reaction between antigen liberated at the site of the lesion and the antibodies produced by the defensive mechanism produces a necrotizing agent which destroys the new-formed granulation tissue in the lesion and thus prevents its healing.

As long as one succeeds in administering doses that are sufficiently small, it is not harmful. Of course, it is possible because of error in judgment to give a dose that is too large for the patient at the time and do harm.

When treating on the hypothesis that tuberculin therapy increases immunity, one also gives repeated doses but strives for at least a local reaction. I doubt that anyone still advocates doses that produce a focal reaction. A focal

reaction would be highly dangerous in proliferative lesions and certainly destructive in exudative lesions in highly allergic eyes.

It is probable that the desensitization program is the more effective. In the practical routine of tuberculin therapy, the oculist guides himself by the appearance of the eye as therapy progresses, but he must never forget that the patient may have other tuberculous lesions—in particular intrathoracic lesions—and that he must have the coöperation of an internist to watch the other organs.

Choice of Tuberculin

It possibly makes little difference which form of tuberculin is used, although many experienced workers have decided preferences. If desensitization to tuberculo-protein is the basis of therapy, it certainly can make no difference, and p.p.d. would be the product of choice because of its chemical uniformity. However, since we are still inadequately informed, we cannot arbitrarily disregard personal opinion and belief based on clinical experience. Although we intend by our injection to desensitize the allergic patient, we may at the same time be increasing immunity factors when we use such whole products as Bacillary Emulsion (B.E.). This is not true of p.p.d. Theoretically, the only objection to B. E. is that we may because of inadequate division of particulate matter inadvertently introduce a much larger dose of protein with an occasional injection. This could not be true of O.T.

The factor of real importance, however, is the dose. One should start with extremely small quantities. It is convenient to make a series of

dilutions, 1/10, 1/100, and 1/1000 and so on and number them to correspond to the number of zeros in the denominator than as dilution 1, 2, 3, and so on. Injections are best made intradermally.

It is wise to start with 0.01 cubic centimeter of dilution 6, never stronger than 5. In retinal lesions or in exudative lesions of the anterior chamber, or any lesion which we believe to be dangerous because of its location or the allergic state of the eye, we use No. 6.

We inject twice weekly and make each dose twice as large as the preceding one. As the doses get larger, the intervals may be increased to as much as one week. If we have reason to suspect that the lesion is a dangerous one, the dose may be increased by only one-half the preceding dose. It is dangerous, however, to schematize. One must carefully watch the eye for the slightest sign of reaction. In all cases of doubt, it is wise to give a smaller rather than the larger dose and to increase slowly.

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In treating a subject briefly, there is always great danger that one presents data and their interpretation too schematically. The following references are given so that more extensive reading will dispel any false notions to which my condensation may give rise.

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MODERN METHODS OF CONTROL FOR MEASLES, SCARLET FEVER, AND DIPHTHERIA

ARCHIBALD L. HOYNE, M.D.

Professor of Pediatrics, University of Illinois College of Medicine
Chicago, Illinois

Measles

OF ALL the diseases known to mankind there is none more likely to occur in a lifetime than measles. This very fact is evidence of our inability to control the infection.

Presented before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 29, 1942.

FEBRUARY, 1943

From antiquity to the present day there seems to have been little change in the widespread distribution of measles and the universal susceptibility for all races without regard to climate, habits or social status. Age only is a restraining factor for we know that measles seldom occurs during the first three months

of life. But advancing years exert no check on susceptibility. Panum's vivid account of what happened in the Faroe Islands in 1846 is a good illustration that grandparents and grandchildren may share alike in respect to this disease. There it may be recalled that 6,000 of the 8,000 inhabitants were attacked by measles.

Epidemics of measles come with increases in population. When the supply of susceptibles has been exhausted there must be a pause until more children are born and others have advanced to the age of distinction when they may have measles. London has had an epidemic of measles every two years since 1856 until fateful 1940, when the bombing of the city seemed to have blasted the infection from the atmosphere. For although an epidemic was due none developed. In Chicago we had our greatest epidemic in 1938 when there were 37,831 cases. The next outbreak came last year, so there have been in 1942 only a few sporadic cases during March and April, months when the disease is at its peak in years of prevalence.

Because adults are not immune to measles unless they have experienced an attack, this infection is often of major importance in time of war. Among American troops from 1917 to 1919 there were 98,000 cases of measles. But it was not the office boys, not the city dwellers who suffered; it was the strong, husky youths from the small towns and country districts who had never had measles because they escaped exposure when children.

Measles is generally regarded as a virus disease, although some years ago Tunnicliff reported a green producing diplococcus as the causative factor. Virus diseases are usually more difficult to control than bacterial diseases because of the problems concerned in developing protective vaccines. Moreover, measles is a respiratory disease; it may not only be transmitted before the eruption but it is more contagious in the catarrhal stage than at any other time, and it is one of the most contagious of all diseases. On the other hand, the contagion of measles is not tenacious and it is short-lived. So the chances of measles being conveyed to a susceptible is far greater before the eruption has appeared than afterward. Some believe that by the time the

eruption is fully developed the danger of contagion has practically ended.

The foregoing comments are presented for the purpose of emphasizing the perplexities that accompany any efforts to control measles. But this does not mean that no attempts should be made to prevent measles nor that successful procedures do not exist to accomplish that aim within certain limitations.

Immunization.—There is no artificial method for establishing a permanent protection from measles. And until some means is developed for active immunization satisfactory control of the disease cannot be accomplished. Rake and Shaffer have reported a new measles vaccine but little is yet known concerning its value. Temporary protection from measles is possible by the intramuscular injection of convalescent measles serum. Usually 7.5 c.c. of convalescent serum when given within three days of exposure will prevent the disease. The immunity, however, is not likely to endure for more than two or three weeks. Therefore, if a second exposure occurs two weeks or more after the administration of serum, a second injection will be required for further protection. Because human serum is used there should be no fear of reaction. If human convalescent serum is not available, whole blood from a parent who has a reliable history of having had measles may be substituted. But under the latter condition the quantity injected must be much greater, generally at least 30 c.c. being required.

Placental extract is also used for passive immunity and has the advantage of being easily available, as a rule. When the purpose is to prevent the disease some advise that 2 c.c. of this placental extract be injected intramuscularly at time of exposure and that 2 c.c. more be given about one week later.

Modification.—If any one of the measures just described is instituted more than three days after exposure, the susceptible person will probably develop measles in an attenuated form. Sometimes this result is preferable to prevention because a modified attack of measles leads to permanent immunity as a rule; whereas, absolute prevention is only a temporary state of immunity.

In an epidemic year or at any time that measles is known to be present in a community, chil-

dren with colds, no matter how slight, should be excluded from school and kept at home. Children who have had measles and live on the premises when an active case of the disease exists are allowed to attend school for two reasons: (1) it is assumed that second attacks of measles do not occur and (2) the infection is not carried by a contact for any considerable distance.

Placarding the premises where a case of measles exists is of no practical value in controlling an epidemic.

Scarlet Fever

Although scarlet fever is more subject to control than measles, it continues to be a major public health problem. Epidemics do not occur in any fixed cycles of regularity but the level of incidence remains on a relatively high plane with only slight recessions from year to year in ordinary times. During the epidemic of influenza in 1918, scarlet fever was at a low ebb in Chicago. However, the disease was unusually prevalent in 1916-17. In the present year, scarlet fever has continued the downward trend that became evident in 1941. It is interesting to note in this connection the experience of London in 1939 and 1940. Notwithstanding the exodus of hundreds of thousands of children from the cities in the fall of the former year to escape possible bombings and the return of more than 80 per cent by the close of the same year, there were fewer contagious diseases in London during 1940 than in 1939. No explanation is offered for this occurrence.

Efforts have been made to control scarlet fever by means of hospitalization. In small communities this plan should afford a fair degree of success but in larger cities it is a failure. Likewise quarantine measures applied to homes have often been unsatisfactory for the purpose of control. The explanation for this situation is not difficult. Among the scarlet fever patients entering contagious disease hospitals comparatively few give a history of contact with a known case of scarlet fever. How do they acquire the infection? Our answer must be that patients with tonsillitis or acute pharyngitis are not isolated, nor are those with streptococcal sore throats. Yet these conditions are all contagious and may be due to organisms capable of producing scarlet fever. Moreover, there are

arbitrary periods established for quarantining scarlet fever patients. If the time is three weeks we regard the patient as contagious on the twentieth day of the disease but not on the twenty-first. This means that about 60 per cent of scarlet fever patients are turned loose on the public as scarlet fever carriers. Of course, the ideal procedure would be to require negative cultures for hemolytic streptococci from the nose and throat before isolation is terminated. But in large cities such a plan is not feasible.

Active immunization against scarlet fever by artificial means is the accomplishment most desired. Whether this ideal can now be achieved must depend upon one's conception of this disease. There is no doubt that a positive Dick test can nearly always be changed to negative by injections of scarlet fever toxin according to the Dick method. Nevertheless, the Dick negative individual is not immune to infection by hemolytic streptococci from a scarlet fever patient. But should this occur no rash is likely to appear on the skin even though the throat presents the characteristics of scarlet fever. Moreover, fever and adenopathy may be accompanying symptoms. Under such circumstances a diagnosis of scarlet fever is not likely. But if scarlet fever can occur without a rash, as is generally admitted, how are we to know that the condition is not scarlet fever? Possibly injections of scarlet fever toxin immunize only against the toxemia of scarlet fever, including the rash. Even if we grant only that, the procedure seems advisable. Moreover, if the five regular subcutaneous doses are feared because of possible reactions, the toxin may be administered in three intracutaneous doses of 0.1 c.c. each. The amount to be injected may be determined as follows: 1st dose, 0.2 of third regular dose; 2nd, 0.15 of fourth regular dose; and 3rd, 0.1 of fifth regular dose—all given at weekly intervals.

For passive immunization, convalescent scarlet fever serum in 10 c.c. doses, injected intramuscularly, gives very satisfactory results if used immediately after exposure. Its protective value is not likely to last for more than 10 days to two weeks. Therefore, if there is a second or continuous contact with a scarlet fever patient, it is well to repeat the dose after ten days. Since a human serum is used, unpleasant reactions need not be feared.

Should the convalescent serum be administered several days after exposure, it is likely to modify the attack of scarlet fever even if it does not prevent it. If convalescent scarlet fever serum is not available, whole blood—preferably from one who is Dick negative—in quantities of 20 c.c. to 30 c.c. may be substituted. Or a prophylactic dose of scarlet fever antitoxin can be used instead.

For many years it has been my opinion that if tonsils and adenoids were removed before children entered school there would be far less scarlet fever. Such a procedure might not lessen susceptibility but it would undoubtedly reduce the opportunities for infection from carriers.

Diphtheria

Diphtheria is more easily subject to control than any other disease with the exception of smallpox. Today it is hard to realize the excessive mortality in the past which prevailed for this infection. Morbidity rates are still too high in many of our states, though great improvement has taken place particularly in the East. In 1921 there were 2,165 admissions for diphtheria at Chicago Municipal Contagious Disease Hospital. Following an intensive immunization campaign only 96 diphtheria patients entered the same institution in 1933.

Local circumstances may possibly influence slightly the time selected for active immunization. Usually nine months is a good age for the undertaking. It is just as well to omit the Schick test and assume that the child is susceptible. For the purpose of conferring immunity we have had toxin-antitoxin, plain toxoid and alum precipitate toxoid. Now the first named is seldom used. Plain toxoid is best given in three doses of 1 c.c. each, three weeks apart. Sometimes 0.5 c.c. is given for the first dose. Injections are made subcutaneously. If alum precipitated toxoid is used instead of plain

toxoid, at least two doses of 1 c.c. each should be administered about one month apart.

In recent years there has been an increasing tendency to immunize against more than one disease at the same time and with mixed antigens. This reduces the number of injections required. Ramon in France adopted this plan for diphtheria and tetanus. Combined diphtheria alum precipitated toxoid and tetanus alum precipitated toxoid are now obtainable. The dose is less than originally recommended. Each injection consists of 1 c.c. which is made up of equal parts of the two toxoids. Three doses are administered at from three to four week intervals. When these combined toxoids are administered there is a synergistic action; that is, the antibody response is greater to each toxoid when they are given together than to either one when injected separately. Moreover, unpleasant reactions are said to be no more common when using these combined toxoids than when diphtheria toxoid is given alone. This combined method of immunization is exceptionally valuable and should receive wider attention. If adopted it will often result in lessening anxiety and saving worry about the necessity for giving antitetanic serum. Should an injury occur where the possibility of tetanus must be considered, the administration of 1 c.c. of tetanus toxoid would probably result in approximately seven times as much protection as would be acquired by the injection of 1500 units of antitetanic horse serum, yet no horse serum sensitization would occur.

Still more recently a combination of diphtheria toxoid and pertussis vaccine has been recommended. Sauer advises this be given at seven months of age in three doses of 2 c.c., 2 c.c., and 3 c.c. at three-week intervals. While no synergistic action is claimed for this mixed dose, the results are said to be as good as if immunizations for the two diseases were done separately. The advantage is in the smaller number of injections required.

TUBERCULOSIS—A DISEASE OF OLDER, OCCUPIED MEN

So much emphasis has been placed on tuberculosis as a serious disease of girls and young women that its greater havoc among men has not received the attention that it deserves. As a result of the more rapid decline of tuberculosis in females in this country

there are today 132 deaths among males to every 100 deaths in females, and only at ages ten to thirty is the mortality higher in females.—*The Modern Attack on Tuberculosis* by HENRY D. CHADWICK, M.D. and ALTON S. POPE, M.D.

THE TOXEMIAS OF PREGNANCY

JOHN A. HAUGEN, M.D.

Minneapolis, Minnesota

INCLUDED among the toxemias of pregnancy are diseases peculiar to pregnancy and diseases that occur in the nonpregnant as well.

The symptoms, hypertension, albuminuria, and edema represent a syndrome in pregnancy which may be caused by more than one underlying pathological state. In this consideration of the subject, only pregnancy complicated by this symptom complex will be considered. Consequently, hyperemesis gravidarum, acute yellow atrophy of the liver and the many odd pregnancy complications listed among the toxemias will not be included. Also not included are the various forms of blood pressure elevation such as are found in valvular heart disease, hyperthyroidism, et cetera. Hypertension, albuminuria and edema are the classical findings in preëclampsia and eclampsia, the so-called "true" toxemias. They are also found in nephritis, and in pregnancy complicated by essential hypertension or arteriolosclerosis. The relationship of the acute toxemias to the production of permanent hypertension is the phase of the general problem which has been of most interest of late.

These groups of entities do not always occur singly. This is particularly true of the acute toxemias and their frequent superimposition on an already established essential hypertension. For reasons of simplicity the three main groups will be considered individually.

Preëclampsia and Eclampsia

This group of the so-called hypertensive toxemias are peculiar to pregnancy. They occur in patients who, as far as our clinical methods of evaluation are concerned, have normal vascular and renal systems. The high incidence of ultimate permanent hypertension among the group of patients having this complication suggests that these patients may have the substratum for a hypertension which did not become manifest before their toxemia. As yet our clinical methods of evaluation do not permit recognition of this substratum when it is still in the "pre-hypertension" or subclinical stage. Preëclampsia

and eclampsia are considered to be the same entity, varying only in severity. They usually make their appearance in the last trimester of pregnancy. In the absence of permanent vascular or renal pathology, all signs and symptoms disappear by the third postpartum month.

Their etiology still remains obscure. The etiologic agent is thought to arise in the placenta rather than in the fetus. Presumably some substance is liberated which, among other characteristics, causes a rather generalized arteriolar spasm.

In most instances following delivery of the child and placenta, there is a fairly rapid return to normal. Unless vascular or renal pathology were existent before the toxemia or developed during the course of it, most of these patients are left without sequelae of the disease. Evidence of its presence is usually lacking by the time of the three months' postpartum examination.

The severity of the disease has been adjudged by the arbitrary choosing of blood pressure levels. A systolic pressure over 140 and/or a diastolic pressure over 90 mm. Hg. are accepted as pathological levels. Mild and severe pre-eclampsia are determined on the basis of the systolic pressure being above or below 160 and/or the diastolic pressure being above or below 100 mm. Hg. If convulsions or coma ensue, the diagnosis becomes eclampsia.

Glomerulonephritis

The term chronic nephritic toxemia has led to considerable confusion. Its use has been largely abandoned because most patients so diagnosed have been shown to have arteriolosclerosis which is indistinguishable from essential hypertension.

Glomerulonephritis presents a very specific problem. It occurs as a complication of pregnancy only coincidentally. There is no evidence to support the theory of relationship between the development of chronic glomerulonephritis and the acute toxemias. Fortunately, acute glomerulonephritis occurs in association with pregnancy only rarely. The added load of pregnancy

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on kidneys so affected leaves little hope for the patient's survival unless the pregnancy is interrupted. Fortunately many patients recover from acute glomerulonephritis. Following the healing of the acute nephritis, if a chronic glomerulonephritis has not developed, a pregnancy may be again undertaken and will usually progress uneventfully. Chronic glomerulonephritis, on the other hand, never permits complete recovery. Here, also, allowing a pregnancy to continue in a patient so affected would invite certain maternal disaster because of the rapid advancement of the nephritis caused by the added burden of pregnancy.

Essential Hypertension

(Arteriosclerosis)

Of recent years a voluminous literature has appeared on the relationship of pregnancy to permanent hypertensive disease. More specifically the relationship of the acute pregnancy toxemias to this condition has received much attention. The incidence of permanent hypertension among patients who have had the acute toxemias has been shown to be so high that steps toward prevention of essential hypertension have become an integral part of toxemia of pregnancy management.

The finding of an elevated blood pressure in the first months of pregnancy in the absence of other rare and demonstrable causes means arteriosclerosis. Pregnancy hastens the advancement of the disease. Frequently an acute toxemia becomes superimposed. The functional arteriolar spasm in the latter condition occurring in arterioles already narrowed by permanent sclerosis augments the symptoms markedly. Usually after delivery these patients have basal blood pressure levels higher than before the pregnancy.

Diagnosis of permanent hypertension can usually be made by the finding of the hypertension early in pregnancy and by the observing of the sclerotic process in the arterioles of the ocular

fundi. Occasionally the diagnosis cannot be made with certainty until in the puerperium. Persistence of the blood pressure elevation in the remote puerperium in the absence of other causes of hypertension means arteriosclerosis. The frequency of its occurrence following preëclampsia and eclampsia and the importance of limiting reproductivity in patients having permanent blood pressure elevations makes the necessity for taking postpartum blood pressure readings quite obvious.

Recently ninety-four patients having had a hypertensive toxemia of pregnancy treated at University Hospital five to ten years previously, were re-examined. 45.74 per cent of these patients were found to have arteriosclerosis.

The importance of recognizing the presence of arteriosclerosis and in preventing subsequent pregnancies can best be demonstrated by the Johns Hopkins Hospital material. Following a diagnosis of arteriosclerosis on their obstetric wards, a corrected ten-year mortality rate of 17.5 per cent was demonstrated. Patients in this group that had a subsequent pregnancy, had a corrected mortality of 39.5 per cent.

Conclusions

Thorough physical examination of obstetrical patients early in their pregnancies is imperative. The finding of an elevated blood pressure demands a careful search for the underlying cause in order that proper treatment may be administered. Patients not seen until late in their pregnancies often present a more complicated problem because of frequent superimposition of an acute toxemia on an already developed arteriosclerosis.

Careful observation of blood pressure levels in the puerperium is of equal importance. In the light of present knowledge, limitation of reproduction is strongly urged in patients with permanent blood pressure elevations.

DEAFNESS IS SOMETIMES DUE TO ALLERGY

Hearing can be improved or restored in some hard of hearing patients by allergic treatment, Dr. Hugh H. Kuhn, of Hammond, Indiana, told the Fifth Annual Forum on Allergy at Cleveland. Not all deafened patients can be helped. In some cases, however, characterized by variation in the degree and time of hearing

loss—patients, for example, who hear better on some days and worse on others—the cause may be an unsuspected allergy which causes a swelling of part of the hearing mechanism with consequent loss of some hearing.—*Science News Letter*, January 23, 1943.

USE OF THE SULFONAMIDES IN PREGNANCY

MELVIN B. SINYKIN, M.D.

Minneapolis, Minnesota

WITH the advent of sulfanilamide and its related compounds, almost immediate clinical application was found in the field of obstetrical infections. The dreaded puerperal infections, commonly due to the beta hemolytic streptococci, were found to respond with almost spectacular results and as early as 1937 a marked reduction in fatality rates, even after blood stream invasion, was reported² from the isolation division of the Queen Charlotte's Hospital in London, where sulfanilamide and prontosil were used in every case of puerperal sepsis starting in 1936. Since then the discovery of derivative drugs has been so rapid as to make it difficult to determine which drug to use. The newer drugs, especially sulfathiazole and sulfadiazine are much less toxic and possess a bacteriostatic effect upon a much wider range of organisms than does the parent drug, sulfanilamide.

Probably nowhere has the use of sulfonamide drugs been more welcome than in the treatment of puerperal and postabortal infections. The beta hemolytic streptococcus, largely responsible for the severe form of the disease, is almost specifically inhibited in its growth by the sulfonamides, but other organisms such as the non-hemolytic or anerobic streptococci are more resistant. Sulfathiazole and sulfadiazine, in addition to having less of the unpleasant side-reactions of sulfanilamide, attack a wider range of organisms and have thus become the drugs of choice. In the occasional case an idiosyncrasy to these newer drugs may justify the use of sulfonilamide. The only other advantages of the parent drug are: first, it is less expensive, costing about half as much as sulfathiazole and one-fourth as much as sulfadiazine; and, second, it is more soluble, thus obviating the precipitation of crystals that may occur in the urinary tract with the use of the newer drugs. The first advantage mentioned becomes unimportant when human life is held in balance, and the second avoids a danger that can be minimized by methods of control to be mentioned later.

It is essential to start the drug early in the

course of infection before bacterial invasion occurs with development of pelvic thrombophlebitis, pelvic abscess, pelvic cellulitis or peritonitis. Tissue changes cannot be reversed once they are established and they act as a protective barrier for the organisms against the effect of the sulfonamides. The invading army must be counter-attacked before it has a chance to fortify its new position.

Sulfonamides should be started as soon as the diagnosis of generative tract infection is made. Following the first twenty-four hours after delivery, a rise of temperature to 100.4° F. or higher on any two days of the immediate puerperium should make the diagnosis probable when extra-genital disease can be eliminated as a possible cause. With the first rise in temperature a culture of the uterine cavity should be taken and the type of infecting organism determined. If the culture is taken within five days of delivery, the information is more reliable than later when secondary invasion from the vagina may confuse the picture. The choice of a sulfonamide drug should be determined by the type of infecting organism. However, when the infection is severe, either sulfathiazole or sulfadiazine may be started before the report of the culture is returned.

At the University of Minnesota Hospitals sulfadiazine has become the drug of choice for almost all obstetrical infections. In addition to being more pleasant to take, it is rapidly absorbed and slowly excreted, and so allows a rapid rise in the blood concentration of the drug and a maintenance of the desired blood level with less frequent dosage. This permits uninterrupted sleep for the patient and decreases the nurses' burden. By the same token blood levels may rise rapidly and frequent determinations of these are necessary to maintain the desired blood level of 10 to 15 mgm. per cent. This level is usually reached when 3 to 4 grams are given as the initial dose followed by 1.0 gm. every four hours for the first 24 hours and 1.0 gm. every six hours thereafter. Sulfathiazole is still the drug of choice when infection is due to the gonococcus or staphylococcus. Dosage is the same and

²Read in Symposium on Obstetrics at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 29, 1942.

the desired blood level to be maintained is 6 to 10 mgm. per cent. Blood levels should be checked daily for three to four days, and every second day thereafter. It should be emphasized that the sodium salts of sulfadiazine or sulfathiazole may be given parenterally when necessary, as a 5 per cent solution in distilled water intravenously or as a .3 per cent to .8 per cent solution in saline hypodermically. The injections may be repeated every twelve hours and require frequent blood level determinations for adequate control. Rectal administration is unsatisfactory because of the irregular and unpredictable rate of absorption.

The drugs should be continued in decreased dosage for several days after the temperature has dropped and clinical improvement is manifest. During administration, all possible supportive measures should be used. Small blood transfusions will augment the patient's resistive powers when the infection is severe. Adequate fluid balance should be maintained and recorded, the minimum fluid intake being 3,000 c.c. daily and urinary output best maintained at 1,000 c.c. The latter is important not only as a supportive measure, but to prevent concentration of the urine with its attendant precipitation of crystals of the acetylated sulfonamide.

Although the danger of urinary tract obstruction is believed to be less with sulfadiazine than with sulfathiazole, several cases of anuria due to sulfadiazine have been reported in the literature, two within the last few weeks.^{3,4} The mechanism of this anuria production may be obstruction of the convoluted tubules, kidney pelvis, and ureter due to precipitated crystals, combined with toxic degeneration of the lining of the convoluted tubules. The condition may be avoided by discontinuing the drug and forcing fluids when a marked fall in urinary output occurs or with the discovery of red blood cells together with acetylated sulfonamide crystals on microscopic examination of the urine. The appearance of the crystals alone is no indication to stop the drug. If anuria persists, catheterization of the ureters and frequent irrigation of the kidney pelvis is recommended. The crystals are more soluble in alkaline solution. This has led to the suggestion that sodium bicarbonate be given with each dose of sulfathiazole or sulfadiazine to alkalize the urine and thus make the precipitation of crystals less likely.

Sulfonamide drugs have also been of great

value in the treatment of urinary infections during pregnancy and the puerperium. It has long been known that when urinary infection is once established in pregnancy, it is nearly impossible to sterilize the urinary tract with the ordinary urinary antiseptics such as methanamine or mandelic acid. The sulfonamide drugs, sulfadiazine and sulfathiazole in particular, now permit complete elimination of the usual infecting organisms in most cases, when dosage of 1 gm. every six or eight hours is given for a period of ten days. The desired blood level when sulfadiazine is given is 5 to 8 mgm. per cent and for sulfathiazole 3 to 5 mgm. per cent. In more severe cases the sepsis dosage may be necessary. The colon bacillus, group is readily eliminated from the urine but an occasional case due to infection with the streptococcus fecalis, streptococcus proteus, or streptococcus viridans may be resistant even with maximal dosage of sulfonamides. In such cases reversion to mandelic acid or methenamine may be more effective. Clinical cures should not be accepted as final. The catheterized urine should be cultured after the course of therapy and three negative cultures at monthly intervals used as a criterion of cure. This is demanded by the frequency with which chronic changes occur in the urinary tract following pyelocystitis of pregnancy.

Cultures of the urine should be taken in every prenatal patient who has a previous history of pyelitis, even though no pus can be found in the urine. If the culture is positive, a course of sulfonamide therapy should be given since that patient has a 40 per cent chance of developing pyelitis, even though no pus can be found in the rent attacks have been shown to lead to fibrosis in the wall of the ureter with production of the so-called fixed ureter, and chronic persistent infection of the urinary tract. The treatment of urinary tract infections should be directed toward sterilization of the tissues rather than urine. For this reason dosage should be followed by blood levels rather than urinary levels of the drug. In the occasional case of pyelo-ureteritis during pregnancy, it may be advisable to catheterize the ureters, and when evidence of kidney damage heralds the onset of pyelonephritis, immediate interruption of pregnancy is indicated. Fortunately these radical methods of control are only rarely necessary since the advent of the sulfonamides.

Gonorrhea may now be cured in 90 per cent of cases during pregnancy. Sulfathiazole is the drug of choice and should be given in large dosage—directed to maintenance of a blood level of 7 to 10 mgm. per cent over a period of ten days. The patient is best hospitalized and therapy followed by culture study. This should then be repeated at monthly intervals for three months, each resulting in no growth, before cure is pronounced. Culture for gonococci has been found much more reliable than the smear.

Breast infection may respond to sulfathiazole or sulfadiazine therapy if the drug is started before abscess localization has occurred. At the University Hospital x-ray therapy has been combined with chemotherapy in an attempt to abort breast infections before abscess formation. The results have been favorable in the cases so treated, but it is essential to start treatment within a few hours of onset.

Sulfonamides have been shown to pass through the placental circulation to produce a blood level in the fetus equal to that of the mother. This has not been found harmful to the fetus or newborn and does not constitute a contra-indication to the use of the drugs during pregnancy. However, the potentiality of damage to the fetus is present and one case of hemolytic anemia of the newborn⁸ has been attributed to sulfonamides received by the mother before delivery. Transmission of sulfonamide to the infant by nursing occurs in such small concentration that neither therapeutic nor toxic effects are likely.

The prophylactic use of sulfonamides may be of value in cases of prolonged labor, intrapartum infection, or potentially infected abortion. Some investigators have advocated the use of these drugs routinely for several days after delivery, but the results are too questionable and the dangers too real to justify such a widespread procedure.

The local application of sulfonamide powder finds little indication in obstetrics but may be useful in preventing infection in the repair of third degree perineal lacerations extending into the rectum or when local contamination of the peritoneal cavity is suspected at the time of cesarean section.

Whenever large doses of any of the sulfonamide drugs are given, toxic reactions are possible and should be guarded against by every available laboratory facility. Kidney function

should be determined by means of a phenol-sulphonephthalein test or blood urea nitrogen and therapy should be preceded by complete blood count and urinalysis, the former repeated every second day and the latter daily. Particular attention should be paid to early signs of hemolytic anemia, agranulocytosis and kidney damage. It should be remembered that the sulfonamides may cause liver damage, and one should proceed with caution when it is necessary to use the drug in the presence of jaundice of hepatic origin. Drug fever has been a bothersome complication, but is fortunately less common since the newer sulfonamides came into use. It should be suspected when a rise in fever occurs in a patient after apparent clinical improvement. The drug should be stopped if no other reason for the fever is demonstrable. This will result in a gradual fall in temperature over the next twenty-four to forty-eight hours. Other toxic manifestations that may result from sulfonamide therapy are dermatitis, peripheral neuritis, toxic psychosis and gastro-intestinal upsets. Whenever a toxic reaction occurs, the patient should be warned of her idiosyncrasy to the sulfonamides for her future protection.

The current Minnesota Maternal Mortality study has revealed some shortcomings in the management of sulfonamide therapy. The most common error was the failure to employ bacteriological study as a control for the choice of sulfonamide used. In most of these cases, facilities for such were available. Unwarranted delay in starting chemotherapy may have been contributory to the fatal issue in at least two cases, while totally inadequate dosage was used in others. In one patient a dose of 5 gr. of sulfonamide four times a day was given for severe puerperal sepsis and in another 45 gr. of sulfathiazole was given rectally, daily, in a patient who finally succumbed to peritonitis following puerperal sepsis. It should be emphasized here that full dosage is imperative if therapeutic results are to be expected. Sulfathiazole was given orally to one patient while nasal suction apparatus was in operation; a rather round-about method of sterilizing the contents of the apparatus.

Finally it is quite apparent that full advantage is not always taken of available laboratory facilities to insure early detection of reactions should they occur. Frequent blood counts and daily

urinalysis should be routine in patients receiving full sepsis dosage.

We should remember that our new therapeutic ally carries a double-edged sword which can be directed against the patient as well as against the disease.

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OBSTETRICS IN THE HOME

E. S. PALMERTON, M.D.

Albert Lea, Minnesota

IN the preparation and reading of this paper I am quite aware that a large number of Minnesota doctors deliver women exclusively in hospitals. Literature and research on obstetrics appear to be addressed pretty much to this type of practitioner. If a doctor wishes to inform himself on new steps applicable to home deliveries he is forced to search out infrequent articles, or, what is somewhat disconcerting, a nursing textbook on obstetrics.

With each year passing, a larger percentage of deliveries occurs in hospitals, and this is as it should be. Every doctor wants the general advantages and above all the safety of the hospital for his maternity cases. However, the fact remains that home deliveries form a real and considerable part of many doctors' practices. Is home obstetrics to be considered primitive and regrettable, to be discouraged and stamped out as fast as possible?

For the United States in 1939, the number of home cases almost equaled the hospital cases. Certain states had less than 20 per cent of the mothers delivered in hospitals—Alabama, Arkansas, Kentucky, Mississippi, South Carolina, and West Virginia. At the other end of the list are those with 80 per cent to 90 per cent of mothers being confined in hospitals: Connecticut, New York, Washington, California, Massachusetts and New Jersey. Minnesota's figures for that year were 64 per cent hospital cases, 36 per cent delivered in the home. In 1941, of the 55,622 deliveries in our state, over 15,000, or nearly 28 per cent, were home cases.

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Certain areas of our state are sparsely settled and hospital care for the pregnant woman is often impossible. In the more thickly settled areas there will be found certain women who choose to have their babies at home. The chief reason for this is economic. Most of these families are not receiving charity; they proudly and painfully pay necessary expenses. Hospital care which can possibly be avoided is not on their budget. If M.D.s refuse to give these perfectly good patients care in their homes, the grandmother or the neighbor, or (what may be fully as undesirable) the osteopath or chiropractor will take charge. In our county of Freeborn the cultists are delivering a small but persistent percentage of home cases. They are to a certain extent cases which the M.D., some M.D., has cast off politely—I know this to be true from experience. The sloughing, unintentional though it be, of home confinements to the cultists is an obvious menace, for the mother will thereafter go to the man who has delivered her for other conditions for which she or her family may need care.

Those of us physicians, then, who have anything to do with obstetrics in the home have an obligation to make the home case comparable to that in the hospital, first from the standpoint of safety, then, as much as possible, comparable in comfort and convenience for our patients and ourselves. It is perfectly possible to carry many of the recent advances in obstetrics to a home case.

I shall touch upon the following with reference to home delivery, reminding you that I have neither time nor desire to discuss these points fully:

1. Maintenance of technique.
2. Variations in management with principal reference to drugs:
 - (a) Anesthetics and analgesics. (b) Vitamin K.
 - (c) Sulfonamides. (d) Oxytocics.
3. Emergency measures for shock.
4. Training new doctors in home obstetric practice.

Maintenance of Technique.—The home case is usually unaccompanied by the frills but need not be without the essentials of good surgical technique. Sterile supplies ready beforehand range from the large pack, complete with sheets, drapes, gowns and towels safely autoclaved, to virtually nothing. It is worth noting that in the work of the Chicago Maternity Center (of which more later) nothing sterile is carried along to the home except towels, cotton and gauze. Gowns are not used. However, the operators are capped and masked. Gloves and instruments are boiled together. Much use is made of newspapers for ordinary cleanliness, and a cone of newspapers pinned at the foot of the operating table (usually a kitchen table) serves in place of a Kelly pad. The patient is prepared by perineal shaving, and the vulvar area cleansed with green soap, then 1 per cent lysol solution, and finally 1 to 500 bichloride solution. When ready to work a sterile towel is slipped underneath the buttocks, and this area, the vulvar area and the pans of instruments and sterile solutions, constitute the clean areas and every effort is bent to keep them clean.

There is a rather pertinent argument against elaborate draping in the home. The so-called sterile field thus created is not understood by lay helpers, and it is almost sure to be contaminated when the physician is not looking. Unless the personnel is trusted by the doctor he might better leave thighs and abdomen bare than have them covered by clean sheets he knows are not sterile.

In some counties in this state, the Red Cross or the county nurse supervises the putting up of packs for home confinements. These are usually autoclaved without charge in a nearby hospital. If autoclaving of such bundles is not possible, they may be baked in an oven for two hours at 320 degrees Fahrenheit. The contents of these bundles vary, but the pack I have used contains two bedpads constructed of newspaper backed on one side with muslin, a half dozen home-

made perineal pads, a package of cotton pledgets and a bundle for the baby containing gauze squares, tape and belly band, and a receiving cloth for the baby. A sterile pack of this sort is a great comfort to a doctor no matter what type of home he enters for a confinement; it is especially comforting when he is called, as happens not infrequently, to deliver a perfect stranger in wretched surroundings, the mother having made exactly no preparation for confinement.

Many very good and able physicians do not shave the perineum. These same doctors will shave a portion of the scalp before stitching a laceration there, or they will shave an axilla before removing a gland—surely their logic breaks down when they aver that it is not necessary to shave away the pubic hair.

Throughout a home delivery it is important for the physician to keep from bringing a new strain of organisms into contact with the mother and baby. It is generally held that people are fairly well immunized to their own germs; there is real danger in bringing foreign organisms to them. In this regard it is felt that in many cases the doctor who takes adequate care in the home actually exposes his patient to less risk of foreign infection than if she is delivered in a general hospital, especially a small one where two or three nurses are obligated to care for all types of cases in addition to the maternity group.

Drugs for Anesthesia and Analgesia.—In this regard I have little to say that is new. The doctor usually carries barbiturates, morphine, and scopolamine for analgesia; for anesthesia, ether and chloroform. Chloroform may be required in cases where an open flame is near or the patient has an acute cold. There are types of equipment available whereby nitrous oxide, or even cyclopropane, may be used in the home. I have had no experience with such equipment.

To the above mentioned agents I wish to add with enthusiasm: procaine for local or block anesthesia. This is common enough in hospital work. It can be added very easily to the routine equipment carried to all home cases. Often it does away with the necessity of making use of an inexperienced, frightened anesthetist.

Vitamin K.—The doctor will do well to carry ampoules of one of the water-soluble Vitamin K preparations when he goes to home deliveries.

You know of the discussion pro and con regarding its routine use. I, for one, do not give it to every mother in labor—but use it prophylactically for the instrumental case, the breech, the premature and the infant I fear to be very large.

Sulfonamide Drugs.—I do not intend to discuss the oral use of these drugs, but will mention their local use in lacerations and episiotomies and on the umbilical stump. If a doctor, because of the setup in the home, feels a weakness in his technique, he has a powerful trouble-shooter in sulfanilamide or sulfathiazole powder. If he is caught with the necessity of packing a uterus, he can, in a moment, incorporate one of these substances into the folds of his pack. In order to make available what has been regarded as a brilliant advance in surgical practice in general, the doctor on home confinement has only to take a bottle of the drug along.

Oxytocics.—The doctor conducting a home delivery has a faithful friend in the ampoule of ergot which may on occasion be used intravenously. He should never be without it; its use by vein is not considered dangerous and it should be used after a prolonged second stage with an atonic uterus resulting, after operative delivery with exhaustion or near exhaustion, or after delivery in which the patient has had very much general anesthesia. As for pituitrin, pitocin, thytuitary and the like—these agents have no broader uses in the conduct of labor at home than in the hospital.

Measures for Shock.—I carry a flask of saline with 5 per cent glucose together with a little package of sterile tubing, connections and needles for infusion. This is not expensive—the investment is only about two dollars and it may be very valuable when shock threatens or appears without warning. Plasma may likewise be bought and carried for emergencies—when in the dried state it is stable and need not be kept cool.

Finally, a few words about training new doctors with respect to home deliveries. These points may not be so apropos during the time when most of our medical graduates are joining the armed forces—but when the war is over there will still be home obstetrics.

I had my first home delivery after I had gone into private practice. I am loyal to my school,

which is the University of Minnesota; however, I am disappointed in having had no opportunity for training in home obstetrics as a student. Such training gives the student invaluable experience in the following ways:

1. He sees the course of labor more thoroughly than he ever would in a hospital. He gets to know signs of exhaustion and other dangers as they appear instead of leaving them as often happens, for a nurse to discover and announce.

2. His ability to set up and maintain surgical technique is severely tested, much to his eventual benefit.

3. As a corollary to the foregoing, he learns to do without: the best possible light, the greatest possible variety of instruments, and as many pairs of hands as he thinks he needs. Whoever has not repaired a perineum by flashlight, and repaired it satisfactorily, has missed a certain feeling of accomplishment.

The outstanding example of training for home deliveries in this country is the Chicago Maternity Center, a service founded shortly after 1930 and now taking care of 3,000 deliveries a year. In seven years the mortality of the mothers was 1.5 per thousand live births. There was a gross fetal mortality of 3 per cent. Of course, all abnormal cases found in the prenatal clinics are excluded from this home care, and hospitalized. Of those considered normal however, before labor starts, all are delivered in the home, and operative deliveries are done without hesitation when indicated (their operative incidence is 6 per cent). Only those cases complicated by abruptio or previously unrecognized placenta previa are taken in labor to a hospital. Even the acute stages of eclampsia are managed, by choice, in the home. It is obvious that the student who has training on this sort of service will learn technique and self-reliance, if he is capable of learning it under any circumstances.

In conclusion, I have no desire to glorify home obstetrics. The increasing trend in hospitalization of maternity patients is to be desired by all. However, I have attempted to remind the medical profession that home obstetrics is not extinct, nor will it be for a long time. Furthermore, it is possible to bring to the home delivery a large number of the improvements which we have made in obstetric care, as regards technique and preparation for the event of delivery,

as regards certain useful drugs and the measures which we feel must be available wherever there is any likelihood of a patient's going into shock.

Finally, I ask for training in home obstetrics

for the medical student, for more than passing attention to this type of practice in the literature, and for appropriate emphasis on the problems of home obstetrics in postgraduate studies.

THE MANAGEMENT OF OCCIPITOPOSTERIOR POSITIONS

WILLIAM C. KEETTEL, M.D.

Obstetrical Consultant, Wisconsin State Board of Health
Madison, Wisconsin

THE most frequent question that is asked me by the general practitioners of Wisconsin is, "How do you handle occiput posteriors?" It is realized that numerous excellent articles have been written on this subject. However, it seems as if many of the more recent articles have tended to confuse rather than to clarify how best to manage this complication. Recently I saw several physicians in rural areas who were greatly alarmed because they had no facilities to make x-ray studies of the pelvis, so they might classify the type of pelvis and in this way know whether to deliver the baby as an occiput posterior or to rotate it to an anterior position should difficulty arise. For this reason it is felt a brief review of the management of this rather common complication might be in order.

The incidence of occipitoposteriors varies greatly; it would seem as if the number reported depends entirely on the time during labor when the diagnosis is made. Calkins,¹ who has made an extensive study of fetal positions, made his initial examination early in the first stage of labor. He reports an almost equal distribution of anterior and posterior positions. On the other hand, when the initial examination is made late in the second stage of labor, the number reported is extremely small, for only the complicated ones, that is those that have failed to rotate, are recognized. The 85 to 90 per cent of occiput posteriors that rotate spontaneously go unrecognized. Because of this fact occipitoposteriors, to many of our physicians, are a dreaded complication.

It is stated by most leading authorities that the head enters the pelvis either in the oblique

or in the transverse diameter. Why occiput posteriors occur and why spontaneous rotation to an anterior position does not always take place has been the subject of much speculation. Many theories have been advanced which are beyond the scope of this discussion. Suffice it to say that spontaneous anterior rotation, through an arc of 135 degrees, does occur in 85 to 90 per cent of the cases. This rotation is usually completed during the second stage of labor when the head is on the pelvic floor. To the remaining few that do not rotate spontaneously three things may happen: some will start to rotate but will become arrested in the transverse position; another group will remain either as a right occiput posterior or left occiput posterior; and lastly, a few will rotate posteriorly becoming a persistent occiput posterior, or an occiput sacral position, as it is called by others.

The proper management of a given case begins with the diagnosis of position, and careful abdominal examination is very helpful. Usually one feels the back deep in the right or left flank; the fetal small parts are prominent and are located well anteriorly. The point of maximum intensity of the fetal heart is located most frequently in the flank. However, if the head is not well flexed, the chest will be thrown anteriorly, and then the fetal heart will be heard best in the anterior quadrant of the abdomen.

The course of labor may occasionally give presumptive diagnostic signs, particularly in those cases where the head is slow in rotating. The signs that are most frequently mentioned are early rupture of the membranes, a head that is poorly fixed in the pelvis but not engaged, excessive lumbar pain, and poor, irregular uterine contraction coupled with slow dilation of the cervix. These signs are by no means constant

¹Read in Symposium on Obstetrics at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 29, 1942.

and are not considered as prominently as they once were.

In addition to the usual findings noted on rectal examinations such as the degree of cervical dilation and effacement and the station of the head, one frequently is able to determine the location of the posterior fontanale and the oblique in which the sagittal suture is located. However, in many instances one is not sure of the diagnosis; for these cases we reserve the sterile vaginal examination to be done when it seems interference is advisable.

Frequently when the caput succedaneum is well formed it is impossible even by vaginal examination to identify for sure the anterior fontanale with its four converging suture lines, or the posterior fontanale directed toward one or the other sacro-iliac synchondrosis. In these cases one feels for the posterior ear, thus determining the position of the occiput. Another procedure that is often helpful is to palpate over the area which you anticipate is the frontal region; if it is, the two frontal bones will give a sensation of crepitation, while the single occipital bone will not. In any of these examinations one must be very careful in estimating the station of the head, for if there is a large caput succedaneum present, the head appears to be more deeply engaged in the pelvis than it actually is.

As many obstetricians have mentioned, the treatment of occipitoposteriors begins during the first stage of labor. This is particularly true when this stage of labor is prolonged. Everything possible should be done to conserve the patient's strength as fatigue is an important factor in uterine inertia, postpartum hemorrhage, and puerperal infection. The woman should receive adequate sedation in safe amounts, using an analgesic drug and not a hypnotic. The fluid and dietary intake should be carefully maintained. The bladder should be watched, and if the patient is not able to void, she should be catheterized regularly. The fetal heart should be checked at regular intervals, as marked irregularity or slowing of the heart between pains is significant.

It is rarely necessary to interfere before the first stage of labor is completed. In fact, it is the conviction of many that a great number of the difficulties encountered are due to attempts at delivery before the cervix is completely dilated. In the rare instances where delivery is necessary before the first stage of labor is completed, one

must resort either to the hydrostatic bag, or, if the cervix is well effaced, Dührssens incisions, to complete the cervical dilatation. Delivery is then effected by forceps or version and extraction. Manual dilation of the cervix is no longer considered a desirable or safe procedure.

Cesarean section is never indicated solely for occiput posterior positions. However, cesarean sections are sometimes necessary where there is some other complication present which necessitates an operative delivery. Then the cesarean section is done because of this complication and not because of the fetal position.

The small number of posteriors that have failed to rotate or have only partially rotated frequently give rise to complications during the second stage of labor, most frequently in the form of prolongation of this stage. However, it is well to remember that anterior positions and face and brow presentation also give rise to prolongation of this stage of labor. When delivery is necessary at this time it is done because of some maternal or fetal complications and not because of the position of the fetal head.

The length of time one should wait in the second stage of labor before interfering has been the subject for much discussion. A favorite expression of Dr. Harris,² which is particularly true in these cases, is, "We cannot practice sound obstetrics by the calendar or by the clock." Each patient must be individualized; we must be guided by the condition of the mother and the baby, the progress of labor, and the station of the fetal head.

If the head is high in the pelvis, that is above the ischial spines, we will not interfere until the condition of the mother or baby demands it, or until the head has descended to a lower level. If the head is in the mid-plain of the pelvis or slightly lower, we will interfere if there has been no progress after a reasonable length of time, perhaps two hours. When the head is on the pelvic floor, the time interval will, of course, be shorter. It seems to me that the dictum, "watchful waiting," is most important and in most instances will certainly reduce both maternal and fetal complications, but it might well be amplified to include, "Watchful waiting but never neglect."

When the physician decides that it is necessary to terminate the labor, he determines by a very careful vaginal examination exactly the position of the fetal head. If he finds an occiput pos-

terior, he is confronted with the problem of rotating the head in the safest manner.

It is always best to try manual rotation of the head first, because it is impossible with your hand to produce vaginal tears or trauma to the baby's skull. The difficulty with manual rotation is not the actual rotation but the maintaining of the head in the correct position after the rotation is completed. In order to maintain the head in the correct position several things can be done: (1) place a blade of the forceps beside the baby's head, thus preventing the head from slipping back; (2) place a tenaculum on the baby's scalp; and (3) rotation of the head well beyond the mid-line. The rotation should be done at the level the head has reached in the pelvis, or, if this is not possible, it may be necessary to push the head up slightly. However, one of the main dangers with this procedure is pushing the head too far out of the pelvis, and either losing control of the head, or producing a prolapsed cord.

In a few instances manual rotation will fail, and then one must resort to forceps rotation. The Scanzoni maneuver or double applications of the forceps is the most common method employed. In performing this maneuver one must keep in mind all of the general principles of forceps delivery. In addition there are several other points to consider. The rotation is best accomplished as downward traction is applied; this simulates spontaneous rotation which occurs on the pelvic floor. The handles of the forceps should not be twisted as one twists a piece of rope, but one should always describe a large arc with the handles, thus keeping the head well flexed, and also maintaining the tip of the forceps at a more nearly fixed point. Bill's modification of the Scanzoni maneuver also has many advocates. He maintains that the rotation should be accomplished either at the level of the head or at a slightly higher plane. The Kjelland forceps is advocated by many clinics in the management of the transverse arrests and occiput posteriors.

However, the typical Kjelland application, with the rotation of the anterior blade in the uterine cavity, can be a very dangerous procedure if the individual is not thoroughly versed in the use of this instrument. De Lee's "key in lock" maneuver is also used by many physicians with excellent results, but care must be exercised because one blade is placed over the baby's face at some time during this procedure.

Occasionally it may be impossible to rotate the head through 135 degrees to an anterior position; then one tries rotating the head to a posterior position and delivering as such. In such instances one must remember that a larger diameter of the fetal head is presenting and that extensive pelvic lacerations may be produced unless a deep episiotomy is performed. However, delivery as a posterior is necessary infrequently. The only other time it does occur is in the case of mistaken diagnosis, and I may assure you this happens occasionally to most honest obstetricians.

Version and extraction is rarely necessary and is reserved for the patient where the head remains high in the pelvis. In this particular instance version and extraction has replaced the high forceps as the method of choice for delivery.

In conclusion, the important points to remember about occipitoposterior positions are:

1. Spontaneous rotation occurs in a high percentage of cases, often going unrecognized.
2. The diagnosis of position is essential in the proper management.
3. During the first stage of labor interference is rarely indicated.
4. The indications for interference during the second stage of labor are governed by maternal or fetal complications and not by the position of the fetal head, per se.
5. Manual rotation of the head should always be tried before using the forceps as a rotator.

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TUBERCULOSIS IN INFANCY

Babies can be infected with tuberculosis during the earliest days of life and such infection in certain cases tends to progress rapidly and often ends fatally. The diagnosis of tuberculous meningitis or generalized tub-

erculosis in an infant or child should initiate an immediate and intensive search for the source of infection. —A. S. POPE, M.D., *Journal of Pediatrics*, March, 1942.

ECTOPIA CORDIS

H. J. PRENDERGAST, M.D.

Saint Paul, Minnesota

WE feel justified in reporting this case because ectopia cordis is one of the medical rarities. The condition presents such a striking picture and arouses such interest that it is more than likely that all these cases are reported, yet its relative frequency cannot be given with any degree of accuracy. Cosgrove,³ in 1924, in reporting a case stated that during the twenty years preceding his report not a single case was encountered in the necropsy rooms of the Bellevue Hospital.

In 1938 Ralph N. Barlow, of the Department of Pediatrics, of Washington School of Medicine, reviewed the literature in the *Journal of Pediatrics*, as follows:

"The condition was first described in 1706 by Haller.⁵ In 1866 Peacock,⁹ cited thirteen cases and reported a fourteenth and in 1904 Ballantyne,² mentioned nine additional cases. Cosgrove and St. George,¹² reported a case in 1925, and Wilens and Cutter,¹⁵ reviewed the literature the same year when reporting another case. More recently, in 1936, Kellett,⁷ cited eighteen cases and reported a nineteenth. In 1935 Lideny⁸ reported a case and in 1936 Wanstrom¹³ reported one."

There has been some confusion concerning the exact meaning of the term ectopia cordis, some authors using it to include cases in which the heart is still entirely within the chest cavity but not in the usual position, such as dextrocardia.

Abbott,¹ describes ectopia cordis as "a displacement so that the heart passes out of the thorax and comes to lie either on the outer surface of the body or in the abdominal cavity."

Three types of ectopia cordis have been described according to the location of the heart. Rauchfuss¹¹ termed them cervical, pectoral and abdominal, while Weese¹⁴ termed them ectopia cordis suprathoracica, ectopia cum sterni fissura, and ectopia cordis subthoracica.

In the pectoral type the lesion is produced by failure of complete development of the sternum. Embryologically, the sternum is formed from bi-

lateral anlagen, and failure of the two pieces to fuse causes a fissure sterni with malpositions, principally of the thoracic organs, especially the heart. Schwalbe states that anomalies in the development of the sternum, particularly in the lower animals, is by no means rare and thus anomalous positions of the heart even within the thorax are frequently produced. It is naturally encountered most often in premature or still-born infants.

Pfaundler and Schlossman¹⁰ state that ectopia of the heart is more of anatomic than of clinical importance. With ectopia the sternum is wholly or partially absent and the skin may be normal or also may be lacking. Ectopia may be an isolated arrest of development or may be but part of an eventration in which the greater portion of the anterior chest and abdominal wall is absent so that the viscera of the thorax and abdomen lie outside of the body. Both ectopia, in which the heart may be covered by pericardium or be completely uncovered, and eventration make it impossible for the child to live.

Cervical and pectoral hearts are considered incompatible with life although infants with the pectoral type may live for several days.

Abdominal hearts are considered compatible with life. Holmes⁶ reports an infant that lived for fifteen months to die of empyema. Deschamps⁴ reported a case of a healthy soldier whose heart occupied the position of the left kidney.

Case Report

Mrs. H. S., aged twenty-eight, was first seen in her pregnancy on May 28, 1941, at which time she stated that she had not menstruated since April 17, 1941. In 1931 she had had a thyroidectomy, and in May of 1937 she delivered a normal female infant. No history was obtainable of deformities or abnormalities on either her or her husband's side. Pregnancy was uneventful. On January 10, 1942, the fetal heart 122 per minute was heard just to the right of the midline below the navel. On January 29, 1942, she was admitted to St. Joseph's Hospital. The fetal heart 132 per minute was heard in the midline just below the navel during the first stage of labor at 5:30 P.M. After a moderately short labor she was delivered of a live female infant. The presentation was that of a frank

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breech, delivery sacrum right anterior. With the delivery of the legs, a large bluish pulsating mass was felt at the navel. After completion of the delivery we were better able to visualize the abnormality which consisted of a midline defect of the lower anterior chest wall and the upper abdominal wall through which a large mass extended. The extruded mass contained a large pulsating tumor in the superior part and a part of the liver and some bowel in its lower part. The cord was attached at the inferior margin of the defect which measured about 2.5 inches in length and 1.75 inches in width. The infant breathed promptly and color of the skin was good; no other congenital defects were observed. The baby was quite cyanotic at times during the first day and this became increasingly more pronounced so that during the third day of life oxygen inhalations were almost continuous. Its temperature was subnormal throughout its life. The baby took small amounts of glucose and expelled some meconium. Death occurred in sixty-five hours.

Motion pictures, x-ray studies and electrocardiographic studies were made and we were fortunate in obtaining permission for a post-mortem examination.

X-rays were taken in the anteroposterior and lateral positions. These show the skeletal development to be complete. The lateral view shows omphalocele containing the heart, liver and the transverse colon.

Treatment.—Cases have been reported in which operations have been performed but in no case has there been a satisfactory result. As this infant showed a cardiac difficulty, as evidenced by cyanosis, it was felt that an operation was contraindicated until she had shown a weight gain and an ability of the gastro-intestinal tract and the cardiovascular system to function efficiently over a period of time, perhaps a month. The presence of one anomaly would cause one to expect others.

Autopsy

External Appearance.—The body is that of a fairly well developed white female infant, length 49 centimeters, weight 2715 grams. There is no edema or jaundice. There is moderate dorsal hypostasis. There is slight cyanosis of the nail beds and of the lips. There is a defect in the anterior abdominal wall measuring about 7 by 4 centimeters. This defect begins just below the xiphoid and terminates at the level of the umbilicus. The umbilicus appears to be incorporated in the defect. Covering this defect is a membrane which appears to be rather thin. Protruding in a hernia-like fashion is a portion of the heart and the liver filling in this defect.

Pleural Cavities.—Upon opening the pleural cavities the heart is noted to be pushing the diaphragm downward and producing the herniation just below the xiphoid process. The heart is above the diaphragm and the liver below it. There is no defect of the diaphragm. The vessels leading from the heart appear to be markedly elongated. On examining the external surface of the heart there appears to be a marked di-

lation of the right auricle. The heart measures 6 centimeters from the tip of the auricle to the apex of the ventricle. The heart is about 3.5 centimeters wide. At the junction between the right auricle and the ventricle the costal cartilage of the rib is firmly adherent and seems to produce a constriction between the auricle and ventricle at this point. There are adhesions between the anterior abdominal wall and the right ventricle. The adhesions are vascular. Upon closer examination of the heart the right auricle gives the appearance of a balloon with its narrow constricted portion at the junction of the auricle with the ventricle.

Heart.—The heart weighs 31 grams. On opening the dilated right auricle it is noted that there is no communication of the right auricle with the right ventricle. The only communication this portion of the heart has with any other portion is through what appears to be a foramen ovale which has a perforated appearance and bulges into the left auricle a distance of a centimeter or more. There is a remnant of a valve present in the wall of this right auricle but does not appear to serve any function as blood can go to either side of the valve. The left auricle does not communicate with its corresponding ventricle but there is a direct communication of the left auricle with the right ventricle. The right ventricle appears to be dilated. There is a defect in the ventricular septum so that blood in the right ventricle may go through to the left ventricle. Blood in the right ventricle goes out the aorta. Blood in the left ventricle goes out the pulmonary artery. The coronary arteries arise from the aorta which in turn leads from the dilated right ventricle. From the anatomical arrangement of the heart the blood would appear to go in the following directions: blood returning from the peripheral circulation enters the right auricle; from this point it passes through a patent foramen ovale into the left auricle. From here the blood passes to the right ventricle. From there it goes in two directions, some going out the aorta and some going through the ventricular defect into the left ventricle and from there through the pulmonary artery to the lungs. Blood returning from the lungs to the left auricle proceeds directly into the right ventricle. There is some fluid in each pleural cavity. There appears to be some encroachment of the right auricle upon the right lung.

Lungs.—The right lung weighs 20 grams, the left lung 18 grams. On sectioning, both appear to have a moderate amount of edema present.

Liver.—The liver weighs 110 grams. The external surface appears normal. On sectioning, no significant lesions are noted.

Spleen.—The spleen weighs 5 grams. There are no lesions of importance.

Kidneys.—Both kidneys together weigh 37 grams. The external surfaces appear normal. There are no defects noted. The pelves and ureters appear within

normal limits. The pancreas and adrenals appear normal. There are no lesions in the genital tract. The aorta appears to be within normal limits.

Head.—The scalp and calvarium do not show any abnormalities. On sectioning the cerebrum a few areas of petechial hemorrhage are noted in the mid-portion. There are no lesions in the cerebellum or pons.

Microscopic Examination

Lungs.—There is some congestion and pulmonary edema.

Liver.—There appears to be an acute congestion present.

Diagnosis.—(1) Ectopia cordis abdominalis; (2) Pulmonary edema; (3) Passive congestion of the liver.

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EMBRYOLOGY AND GENETICS IN ECTOPIA CORDIS ABDOMINALIS

F. C. SCHULD T, M.D.

Saint Paul, Minnesota

AFTER the ectodermic and entodermic layers have developed in the early human embryo, there develops between these two layers, irregularly arranged cells, the mesodermic layer.

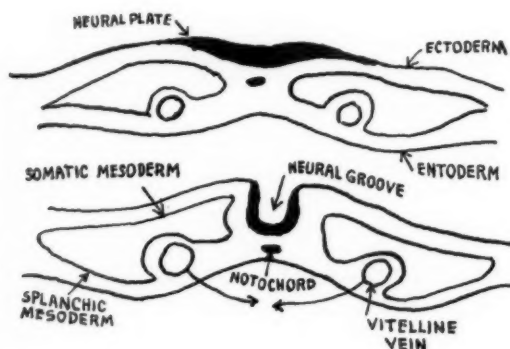


Fig. 1. Early human heart development in its first and second stages.

Very early, in the lateral areas of the embryo a vacuolization develops in the mesodermic layer.⁴ These separations of the mesodermic cells extend lengthwise of the embryo and become two laterally placed continuous tubes lined with a single layer of endothelial cells (Fig. 1). These are the vitelline veins destined soon to conduct

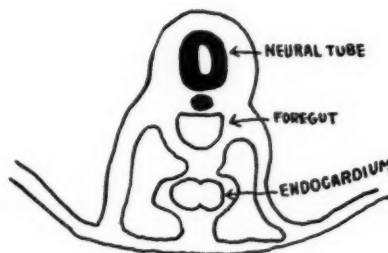


Fig. 2. (left) Early heart development in its third stage.

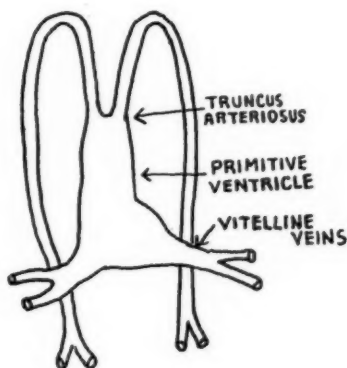


Fig. 3. (right) Early heart development in its fourth stage.

the blood stream, the cells of which at this time consist of nucleated red blood cells only. Nu-

Read before the Ramsey County Medical Society, Saint Paul, Minnesota, March 30, 1942.

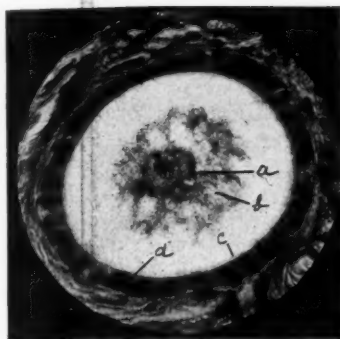


Fig. 4. The human ovum: (a) germinal vesicle; (b) yolk; (c) zona pellucida; (d) corona radiata.

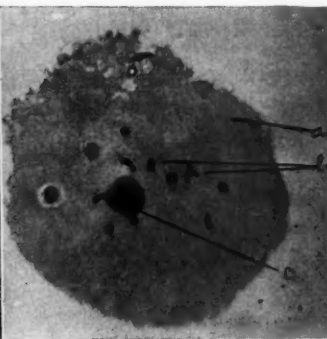


Fig. 5. Corn pollen: (a) the cell; (b) the chromosomes (ten pairs); (c) nucleolus.

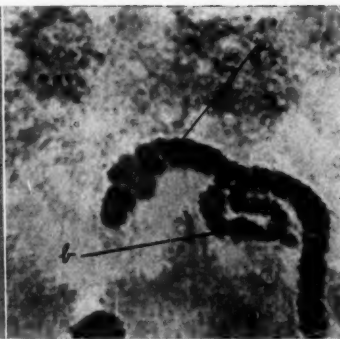


Fig. 6. *Drosophila melanogaster* showing a portion of the x chromosome with a translocation. (a) x chromosomes; (b) the translocation of a portion of No. 3 chromosome.

cleated red cells are present throughout life in all vertebrates, except in mammals.

These parallel vitelline blood tubes approach toward a ventral median line and unite in the region ventral to the head gut³ (Fig. 2). In normal development the heart is now one tube, with the venous blood traversing headwards through the primitive ventricle, then through the truncus arteriosus and then into the arched branchial vessels (Fig. 3). This united tube now becomes longer and at the same time the neural tube takes on a rapid growth, causing the embryo, which up to now was straight, to curl, so that the tail comes in contact with the brain tube. There is now a very limited space for an elongating tube to remain straight, therefore it is necessary for it to coil on itself. The venous or atrium portion remains fixed, while the primitive ventricle coils ventrad. At this stage the heart in every embryo appears ectopic. Also at this stage the tongue and brain tube rest immediately upon the heart (Fig. 8d). The heart position might be pronounced to be ectopia cordis cervicalis.

A force of the proper gene is responsible for the rotation of the ventricle to the left chest position. Now we have a unilocular heart, a single chamber with no division. At this time a protrusion develops from the posterior wall of the heart tube meeting a similar protrusion from the ventral wall, called endocardial cushions (Fig. 8g). These, uniting, form the septum intermedium which causes a division between the atrium portion and the primitive ventricle, allowing for two communicating channels. Now we have a

bilocular heart, the organ of the adult fish and the early heart structure of all air-breathing vertebrates. The next stage is a septum development dividing the atrium into right and left side. Now we have a trilocular heart. The final structural change is the septum dividing the ventricle into right and left, which gives us the normal four chambered heart.

Anomalies of the heart are found in 2.8 per cent of children. As a rule the right half of the heart is the seat of congenital anomalies while the left half of the heart is more often affected by disease in later life.

Predisposing causes of anomaly as given by Birnbaum of Göttingen are: (1) venereal disease; (2) intermarriage; (3) tuberculosis; (4) typhoid; (5) fright during pregnancy; (6) fetal endocarditis.

Congenital anomalies of the heart position are: (1) dextrocardia; (2) ectopia cordis (cervicalis-pectoralis-abdominalis).

The case which was reported by Dr. Prendergast* (Fig. 9), is one of a double congenital heart anomaly: (1) an anomaly of position in that it is an ectopia cordis abdominalis (Fig. 10) and (2) an anomaly of structure (Fig. 11). The anomaly of structure is multiple and consists of:

1. Transposition of the aorta and pulmonary artery.
2. Failure of ventricles to rotate.
3. Absence of mitral and tricuspid valves.
4. A partial mitral valve (useless) on the wall of the right atrium.

*Dr. Prendergast's report appears just previous to this article.

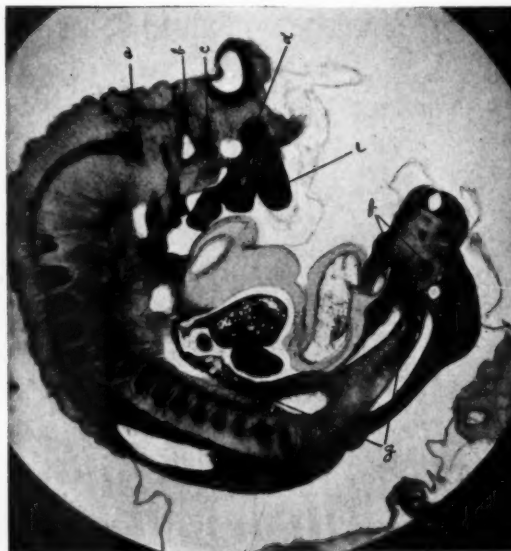


Fig. 7. Lateral sagittal section of a 6 mm. human embryo. (a) ganglionic crest; (b) otic vesicle; (c) acoustic ganglion; (d) Gasserian ganglion; (e) facial processes; (f) anlage of metanephros or permanent kidneys; (g) Wolffian body.



Fig. 8. Sagittal section through neck region of a 6 mm. human embryo. (a) foregut or esophagus; (b) thyroglossal duct, anlage for thyroid; (c) tongue; (d) site of future neck; (e) pericardium; (f) common ventricle; (g) endocardial cushions; (h) common atrium; (i) left common carotid artery.



Fig. 9. Infant with ectopia cordis. (a) the ventricles; (b) the colon and liver; (c) the umbilical cord.

5. No communication between the right atrium and right ventricle.
6. No communication between the left atrium and left ventricle.
7. Absence of a ductus arteriosus.
8. Only one coronary artery.
9. Three foramina ovalæ in the interatrial septum.
10. One large opening in the interventricular septum.
11. A diagonal passage from the left atrium to the right ventricle.
12. A very long ascending aorta.

A superficial examination of the baby showed a well developed average new born. The color was good and there were no other deformities. The head and face development was very good. So that one may conclude that the intrauterine existence of the fetus had not been handicapped by all the abnormalities. The circulation apparently had been adequate. For about twelve hours after birth the color remained good. The baby cried occasionally and kicked its legs about like a normal child. The baby did not seem to be in any distress. A colored movie demonstrates this. Later the baby became cyanosed.

Birnbaum classifies single malformations into five classes:

1. Malformations due to arrest of development: fissures, fusion of organs.
2. Malformations due to excess of development: fingers, toes, teeth, ribs, etc.
3. Malformations due to displacement of tissues and persistence of fetal structures: teratomata, dermoids and cysts.
4. Malformations due to errors of development: transposition of viscera.
5. Malformations due to fusion of sexual characters: hermaphroditism.

ECTOPIA CORDIS ABDOMINALIS—SCHULDT

Death and lethal factors begin at the time the ovum is fertilized. There are many disturbing influences to the developing fetus which depend either upon internal causes or the action of ex-

ficient, as the embryo develops and thereby causes a separation of the amnion from itself there remain agglutinations of the surfaces, and as growth continues the embryo finds itself en-

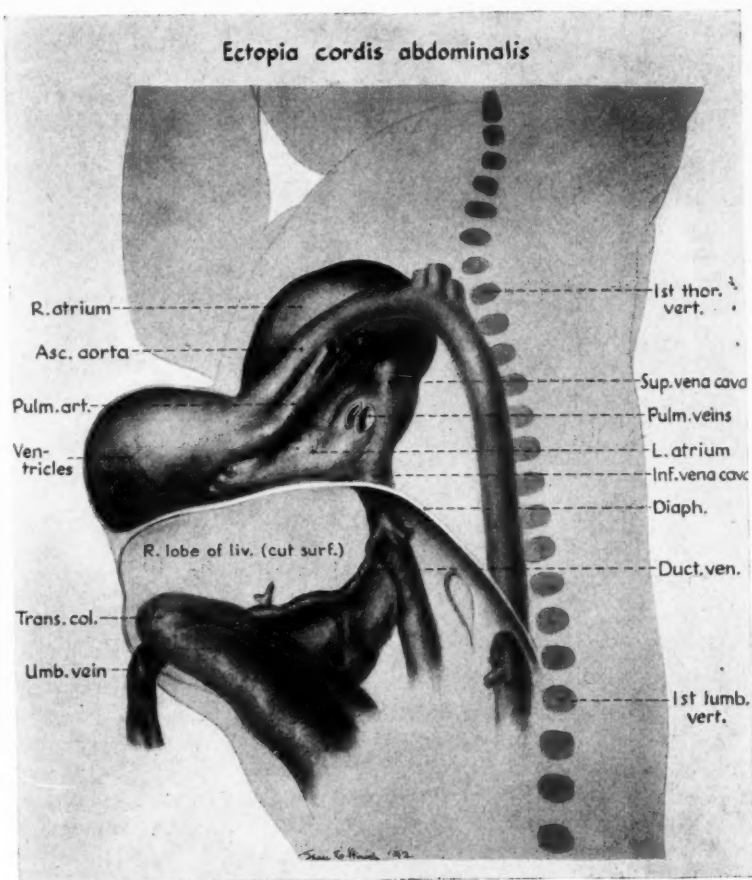


Fig. 10. Ectopia cordis abdominalis.

ternal influences. A trauma to the abdomen severe enough to cause a hemorrhage to the early embryo would cause a deformity. Disease of the parent such as myxedema, severe nephritis, infectious diseases as typhoid and certain poisons may cause developmental deformities. In the majority of cases death and abortion results. Psychic causes are questionable.

Very early the amnion lies in contact with the embryo while separation from it takes place later by the formation of amniotic fluid. This liquor amnii may be deficient, may be present in normal amount, or in excess as in hydramnios. If de-

twined in a mesh of amniotic adhesions, to which may be attributed such developmental deficiencies as are found about the head and in the limbs as amputations. These bands are called Simonart's ligaments. These bands are simple epithelial adhesions or agglutinations and are not inflammatory. In one case of ectopia cordis amniotic bands could be demonstrated on the ventricle as if they had been a causative factor.

Some malformations such as achondroplasia, albinism or hemophilia, are due to inherited tendencies either dominant or recessive.

In attempting to explain another cause why

anomalies occur, some speculative hypotheses will be expressed, which, though logical, have not been entirely accepted. Such terms as malformation, errors in development, arrested de-

have a properly fertilized ovum but something went wrong in the fertilization of the endosperm.

Studies have been made for years in the *Drosophila melanogaster*, the common fruit fly. In-

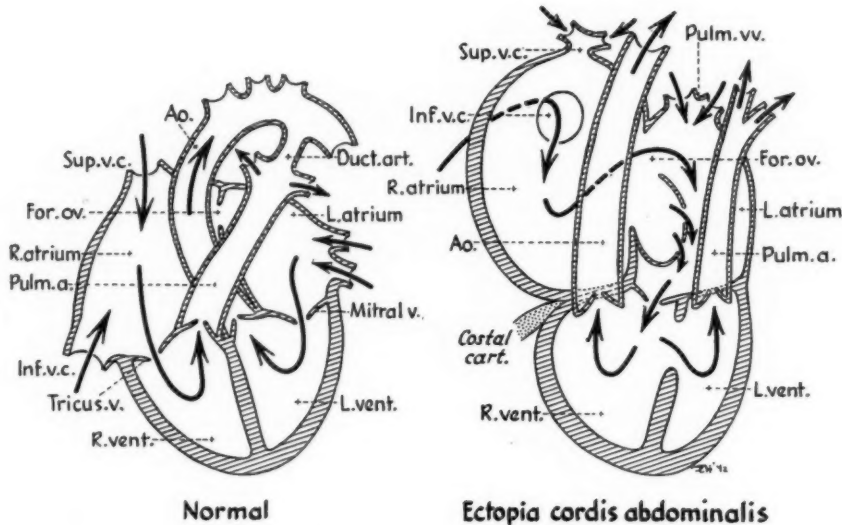


Fig. 11. Line drawings showing circulation in normal conditions and in ectopia cordis abdominalis.

velopment and transposition have been used in the literature to express the cause of anomalies. Such terms have the faculty of putting a finale on scientific thought as to what forces were active or wanting in bringing about a maldevelopment as contrasted to the normal. When a flower is in full bloom or a large ear of corn hangs on a stalk we admire the beauty of such growth but genetically we must admit that there must have been multiple and varied forces at work to develop such color and fragrance and beauty in the flower and a certain process of chemistry in the carbohydrate development of the corn to produce a fullness of formation in every kernel. Compare this to imperfections in flower development or imperfect kernels or partially developed kernels in the corn, and it is conceivable that some forces were lacking and this can be found in the chromosome and gene structure. Translocations take place in the chromosomes and mutations in the genes, to bring about irregularities in the structure which the chromosome is prepared to build when in normal alignment. So we find a kernel in the ear of corn might

asmuch as the fruit fly produces twelve generations in a year, x-ray and radium effects can be so easily studied and the changes observed. The salivary gland of the maggot of the fruit fly lends itself so readily to such studies. Here we find a definite translocated part of one chromosome attaching itself to another chromosome, and in so doing distorting the development of that portion of the fly structure which such fragment of chromosome was assigned to. Such a translocation can be seen in the photomicrograph (Fig. 6) where a fragment of chromosome number three has attached itself to the x chromosome and there will be an anomaly in the fly, probably lethal. The human being does not lend itself so readily to research and laboratory studies, since a student in genetics would have to live a long life to study the anomaly in two generations. Although there are only four pairs of chromosomes in the *Drosophila*, there are five hundred pairs of factors known.

It seems reasonable to suppose that as vitamins are the exogenous hormones, and the hormones of the endocrine glands control the mechanism

of the developed body, it follows then that the hormones of the intracellular genes control the mechanism of development.²

We have learned in the past twenty years of the great potentiality of insulin, a polypeptid which is easily digested. Because the chemistry of insulin of fish, dog and man are identical, allergy is no problem. But we know that if we have an excess of insulin or a deficiency, the mechanism of the body is badly disturbed. Hyalinization of the islands of Langerhans may be the answer, or a tumor may be present.

Thyroxine has a definite force, regulating the oxygen requirement in the body mechanism. An imbalance can take place. An underdeveloped gland may exert an insufficient force to provide the body with enough oxygen, while a pathologic condition might provide a great excess of oxygen to the body. In a similar manner an imbalance of other endocrine glands like the suprarenals, the pituitary, the testicle, the ovary and the parathyroids may act as a misdirected force and may be lethal.

In a very similar way the genes, which are placed in a linear position on the framework of the chromosome, exert a dynamic force and reproduce their kind. Chemically, the transverse striations, seen on the salivary gland chromosome of the drosophila are nucleoproteids. Whether these microscopically visible bodies are the genes, no geneticist will venture to say, but they will admit that these bodies of nucleoproteids are the

loci of the genes. Whether the force exerted is a purely chemical one or whether there is an electric influence, or whether there is a combination of these forces, no writer in genetics will mention.

This force may have a normal exercise and a normal being, without a visible defect, will be developed. This means that all the component genes have functioned without failure and every portion of the developed organism is normal.

The force may be dynamic but misapplied or misdirected and an ectopic heart or an anomalous heart structure may develop because of mutation of genes or translocation of a portion of one chromosome upon another chromosome. In our case this was lethal. The force may be deficient or wanting and a hair lip or cleft palate or extrophy of the bladder appear in the newborn infant.

Chemistry and physics have long ago gone through their trial years and are now well accepted in their field. The next science to take its bow to the world is genetics. It already has made big strides and has proven its dignity in the lineup of the sciences.

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AMERICAN ATABRINE PROVES IDENTICAL TO FOREIGN DRUG

Controversy over whether atabrine, the antimalarial just made official in this country, is identical and equal to the original product developed in Germany, has now been settled in favor of America's chemists.

A report issued by the National Research Council establishes the fact that the drug manufactured in this country is comparable in every respect with that produced in other countries, according to the *Journal of the American Medical Association* (November 14).

Atabrine, chemically known as quinacrine, is now in mass production as a substitute for war-scarce quinine

using the process developed abroad. But chemists here have also found their way through the intricate steps of chemical synthesis which produce the bright yellow crystals used to combat malarial fever.

Unpleasant side-actions sometimes accompanying the administration of the drug led to the suspicion that there might be defects in the manufacturing process or impurities present. Doubts have been dispelled by investigations in leading institutions throughout the country which indicate that these minor difficulties are inherent in the atabrine itself, as occurs in many standard medicines.—*Science News Letter*, November 28, 1942.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Lofness, M.D.
Pathologists

Presentation of a Case

DR. HEISE: The case is that of a colored woman, forty-seven years old, who entered the Minneapolis General Hospital on October 26, 1942, and expired two days later. She was first seen in this hospital in the surgery department in 1937 because of a lower abdominal mass. A myomatous uterus, a dermoid cyst of the right ovary and the appendix were removed. She had an uneventful convalescence and was discharged after three weeks. She remained in good health until October 25, 1942, when she developed severe pain in the lower abdomen. The pain started rather suddenly, was crampy but persistent, and was present throughout the lower abdomen. She vomited about eight times during the next twenty-four hours, became weak and somewhat confused, and was then brought to the hospital and admitted.

Her temperature on admission was 100.6 degrees, her pulse rate 120, respiratory rate 20 and blood pressure 126/92. She complained of severe abdominal pain, her skin and mouth were dry, she was somewhat confused and appeared very ill. Examination of the head and chest was essentially negative. Her abdomen was diffusely tender and a vague, very tender mass about 10 cm. in diameter was palpable just to the right of the umbilicus. Pelvic examination revealed a green discharge from the cervical stump and moderate diffuse tenderness in the adnexal regions. Her hemoglobin was 102 per cent, her white blood count was 9,500 with 87 per cent neutrophils, and her B.U.N. was 20 mg. per cent. A urinalysis and Kahn were negative. Smears of the cervical discharge were negative for gonococci. A duodenal suction tube was passed through the nose and she was given intravenous fluids. Shortly after admission a peritoneal puncture was done and a small amount of fluid containing numerous neutrophils was obtained. An x-ray of the abdomen was essentially negative. She was treated conservatively but her condition rapidly became poorer. The

abdominal pain and mass persisted. Her temperature was 102 degrees the next day and rose to 107 degrees before she died on October 28, 1942.

DR. HERTZOG: This woman entered the hospital with signs and symptoms of acute inflammation within the abdomen. We know that she had her appendix removed five years ago, and this is rather late for any complications except those due to adhesions. A peritoneal puncture supported the clinical impression of peritonitis. A vague tender mass was palpable in the mid-abdomen and an abdominal x-ray was negative for free gas. Dr. Peppard, do you have any suggestions?

DR. PEPPARD: There are several things to consider, and the first thing that comes to mind is some type of bowel obstruction with progression to peritonitis. The sudden onset, the fact that she has had abdominal surgery, which is often followed by adhesions, and the recent tender mass all lend support to this possibility. Another thing to consider is primary pneumococcal peritonitis. In years past we saw a number of cases of this disease but recently it has been more uncommon. However, it would be difficult to explain the mass on this basis. The other intra-abdominal accidents such as acute pancreatitis, acute cholecystitis and perforated peptic ulcer must be considered. However, about 75 per cent of patients with perforated ulcer show free gas on x-ray within a few hours.

STUDENT: Does the lapse of five years since her operation lessen the likelihood of obstruction due to adhesions?

DR. PEPPARD: Not very much. Obstruction from an adhesive band can follow surgery by many years. What did the mass feel like?

DR. HEISE: It was about 10 cm. in diameter, very tender, moderately firm, and it was not fixed.

DR. HERTZOG: What did the surgeons think about this mass?

DR. HEISE: They thought it might be a carcinoma with perforation.

STUDENT: Why wasn't she operated upon?

DR. HEISE: Because of her poor condition on admission, she was treated conservatively.

DR. HERTZOG: Dr. Heise will now describe the findings of the autopsy and you will note that they are rather unusual.

DR. HEISE: The only significant changes were in the abdominal cavity, except for slight bronchopneumonia in the lower lobe of the right lung. The peritoneum was moderately congested and lustreless, and there was approximately 500 c.c. of purulent, foul-smelling fluid in the peritoneal cavity. Several loops of small bowel were matted together in the mid-abdomen. They were covered by a yellow fibrinous exudate and the slightest disturbance caused pus to exude between them. After separating the loops of bowel, approximately 50 c.c. of pus escaped. The most discolored segment of bowel was in the upper jejunum about 50 cm. beyond the duodenum. In this region there was a diverticulum protruding into the mesentery; it was 4 cm. long, 2 cm. wide and its opening into the jejunum was 8 mm. in diameter. There were two pieces of firm stool in the proximal portion of the diverticulum. The wall of the diverticulum was thin, discolored, friable and covered with pus, but no gross perforation was seen. The intestine was sharply angulated at the diverticulum and above this it was moderately distended. There was a similar but smaller diverticulum 15 cm. further down the bowel but it showed no inflammation. The other organs were essentially normal.

DR. PEPPARD: Diverticula are uncommon in the upper portion of the small bowel, and diverticulitis more so. This explains the mass and the obstruction. We frequently see duodenal diverticula but they seldom cause any trouble. Is the diverticulum in this case comparable to them?

DR. HERTZOG: Dr. Lofsness will discuss this question for us.

DR. LOFSNESS: There are certain regions in the intestine where diverticula are most common, and these are the sigmoid colon, the duodenum and the terminal ileum. In the sigmoid colon, diverticula are seen in approximately 5 per cent of people. They are small and multiple. Usually they are eight to ten millimeters in diameter, have narrow opening into the bowel, and often protrude into the appendices epiploicae. They sel-

dom extend down into the rectum but occasionally are present in the descending colon. They are most common in older people and seem to be associated with constipation. Recently we had a patient with signs and symptoms of appendicitis, but operation revealed small diverticula of the cecum with acute inflammation; this, however, is quite unusual. In the sigmoid colon, diverticula give no trouble in at least 80 to 90 per cent of people. They sometimes show chronic inflammation with diffuse thickening of the wall and resulting stenosis and obstruction. This lesion is not infrequently misinterpreted as carcinoma. Acute sigmoid diverticulitis is less common. The process is usually sealed off, with local abscess formation and occasional perforation into the bladder.

Meckel's diverticulum occurs in the lower ileum, usually 50 to 100 cm. above the cecum. They are usually less than 10 cm. long and are located on the antimesenteric surface. They are found in one to two per cent of people and are due to persistence of part of the fetal yolk stalk. They sometimes are the site of acute inflammation and simulate appendicitis. Occasionally the mucosa is in part of gastric type with acid formation, and rarely a peptic ulcer forms.

Other diverticula of the small bowel occur into the mesentery. This is probably because the wall is weaker due to the penetration of the blood vessels, and the lack of a peritoneal covering. Our case falls into this group. There are usually only one or a few diverticula, but in some cases dozens are found. They are not unusual at autopsy but rarely cause any trouble.

Diverticula of the duodenum are common, but complications are rare here also, probably because of their relatively wide openings. In the first portion they are usually due to peptic ulcer with healing and scar formation. In the second portion they are apparently congenital, and are often located near the papilla major.

The pathogenesis of this case, and perhaps most cases of diverticulitis, is comparable to that of appendicitis. There is a blind pouch lined by secreting epithelium which becomes obstructed by a fecolith. The accumulating fluid distends the diverticulum, and this pressure reduces the blood flow through the wall, lowering local resistance to the ever-present bacteria.

DR. HERTZOG: We have presented a case of peritonitis of quite unusual etiology. The final anatomical diagnoses are: (1) Acute jejunal diverticulitis; (2) Generalized peritonitis; (3) Bronchopneumonia.

Peanut oil, now being used for cooking and salad oil, is used industrially in shaving lotions, cosmetics, soaps, dyes and axle grease; and medically, among other uses, in massage for infantile paralysis victims.

HISTORY OF MEDICINE IN MINNESOTA

THE ASIATIC CHOLERA IN SAINT PAUL

JOHN M. ARMSTRONG, M.D.
Saint Paul, Minnesota

(Continued from January Issue)

Now for the cholera—most of the few cases here occurred before the station was ready for use and are unrecorded. On August 14 (a Thursday), the steamer *Canada* arrived from down the river with two sick men aboard, who the clerk reported were just suffering from cholera-morbus, although five had died on the deck on the Sunday previous. The clerk said the men had eaten a large quantity of green apples and buttermilk which had made them ill. The two sick men were removed to some place, now unknown, and the clerk enlightened. Both men recovered. On August 24, the day the Quarantine Station was opened, a Norwegian immigrant named Paul Andreas Anderson, aged sixty years, was taken from a steamboat at the station and died in six hours. Doctor Smith told me he found this man in a moribund condition lying on the lower deck in a pile of filth, having lost about half his weight. No one would go near the man so he himself carried him to the building. The man was hastily buried on the river bank near the station. Shortly after this, two men were taken from a raft on the river to the station, one of them named Williams. They recovered. These were apparently the last patients treated at the station. I can ascertain the case of but one other who had the cholera during this epidemic, a man named Callihan who died September 9 in town. He is the last recorded cholera patient in Saint Paul, although the late Dr. Samuel D. Flagg told me he saw a cholera patient in 1873, and Doctor Stewart agreed with him as to the diagnosis. The Quarantine Station was closed September 19 and cost the city in all about \$3,770. Sometime later, when employes of the city went down to remove some of the furniture, it had disappeared. Some few small articles were recovered from two Frenchmen down the river, but the rest were not found and apparently the search for them was not finished. It was apparent that some one knew where they had gone. The next spring a body was found in the river below Pig's Eye. Doctor Smith, as deputy coroner, recognized the body as that of Anderson and again certified as to the cause of death. The high water had washed away his grave. The last instances of cholera in Minnesota occurred in 1873, eleven cases with eight deaths in a Norwegian immigrant family near Willmar.

While this was the end of the Asiatic cholera in Minnesota, it does not quite end the story, as twice since then the subject has been discussed in meetings of the Ramsey County Medical Society. At the meeting of November 24, 1884, C. D. O'Brien appeared before the Society stating his object in coming to the meeting was to get the sentiment of the Society in regard to the danger to be apprehended from a cholera outbreak in the city next summer. He then proceeded to read a communication to the City Council from the health officer, Dr.

HISTORY OF MEDICINE IN MINNESOTA

H. F. Hoyt, on the sanitary condition of the city and asked what might be done to improve conditions. Mr. O'Brien said he conceived it to be his duty as the executive of the city of Saint Paul to see that everything possible was done in order to protect the people from possible danger. After some discussion, Mayor O'Brien said in order to simplify matters, he would propose three questions to be solved by the Medical Society. First: Is there reasonable apprehension of the cholera coming to the United States and to Saint Paul next summer? Second: What is the present condition of the city as regards sanitation? Third: What is necessary to be done in order to prevent an epidemic here next summer? Dr. A. J. Stone then moved that a committee of two physicians from each ward of the city be appointed to answer the Mayor's questions. Those appointed were:

First Ward.....	Dr. Murphy and Dr. Hoyt
Second Ward.....	Dr. Jones and Dr. Ritchie
Third Ward.....	Dr. Hand and Dr. C. E. Smith
Fourth Ward.....	Dr. Leasure and Dr. Sloan
Fifth Ward.....	Dr. Beal and Dr. Francis

Whether this committee ever reported and what was done is unrecorded in the Society's minutes.

In 1892 a most disastrous cholera epidemic occurred in Hamburg and on September 14, a special meeting of the Ramsey County Medical Society was held to discuss the situation should the disease reach this county and Saint Paul. Dr. Harold Graff opened the discussion. Dr. David Day, a guest of the evening, said:

"I graduated in 1849 and in the five years following saw a good deal of cholera in the hospitals of Philadelphia and elsewhere . . . Each epidemic of cholera is accompanied by a great deal of vague bowel trouble, the so-called cholérine, and it is somewhat difficult to make a diagnosis at first. I learned, however, to recognize the real cholera by the smell, as it resembles very closely the smell of fresh blood. In the epidemic which occurred in this city some years ago (1866), I think there were not more than twenty cases of real cholera . . . I recollect one instance in which it took every member in several families in our elevated rural district . . . The disease is so rapid in its course that there is absolutely no time for hospital treatment."

Dr. J. H. Murphy said:

"I have lived in this state to see two or three epidemics of cholera . . . I do not apprehend that we shall have very much trouble here, even if it should reach this country."

While this discussion was going on, the *Moravia* was steaming towards New York with cholera aboard, but strict quarantine prevented its spread.

BUBONIC PLAGUE IN 1942

A case of bubonic plague in a two-and-one-half year old baby girl in Siskiyou County, California, has been reported to the U. S. Public Health Service. This is the first case of plague in humans in the United States since the summer of 1941, when two fatal cases occurred in the same county.

The child is expected to recover, thanks apparently to treatment with sulfadiazine. The sulfa drug treatment was started following a telephone call to Dr. Karl Meyer, Hooper Foundation, University of California. Presumably it was advised by Dr. Meyer, since he has reported successful sulfa drug treatment of plague in laboratory animals.

Where the little girl picked up the plague germs is not definitely known. Her father had hauled hay from a region where plague-infected ground squirrels were known to exist, and the child was playing in the hay the day before she got sick. Cats, dogs, mice and wood rats in the barn of the child's home are considered other possible sources of infection, since these might have harbored plague-infected fleas.—*Science News Letter*, December 12, 1942.

HISTORY OF MEDICINE IN DODGE COUNTY*

BY JAMES ECKMAN†

Rochester, Minnesota

and

CHARLES E. BIGELOW, M.D.

Dodge Center, Minnesota

The pioneer physicians were in very truth a virile and faithful lot of men of whom it would be difficult to say too much in praise. They all looked upon their calling as a profession and not a business and were ever more solicitous about the welfare of their patients than they were about the size of their pocketbooks. The art or science of medicine (which ever it may be) has advanced with rapid stride in the last fifty years and the physicians of today are much better informed, and for that reason more efficient, than the physicians and surgeons of earlier days; but with all of their advantages I very much doubt if they are as unselfishly devoted to duty as their predecessors.—SAMUEL LORD, *Recollections of Mantorville*¹ (1919).

THE celebrated John Charles Frémont (1813-1890), "Pathmaker of the West"² and first Republican candidate for the presidency, in company with Henry Hastings Sibley (1811-1891) and several others, penetrated to what is now Mantorville in Dodge County in 1838 or 1839.^{3†} In a dense wood nearby General Sibley shot a large stag: "It being the first capture of elk that had been made by the party, I was naturally somewhat elated at my success."³ In the course of investigation of the history of medicine in Dodge County, it is interesting to discover that Frémont, then an unknown young man of about twenty-five years, was "in feeble health."³ The army surgeon at Fort Snelling had advised him to accompany General Sibley on a hunting trip to Iowa as a therapeutic measure, and Sibley was able to report that "Frémont continued to improve daily from the start, and during the prolonged trip he acquired that robustness of constitution which enabled him to endure the exposures and privations to which he was exposed not many years afterward."³

Frémont then proceeded eastward to Prairie du Chien to rejoin the well-known French physicist, Joseph Charles Nicollet (1786-1843), one-time associate of Pierre Simon Laplace (1749-1827), and Dominique F. J. Anago (1786-1853), who awaited the youthful huntsman anxiously.³

According to Professor Nevins,² Frémont never forgot the beauty of Southern Minnesota as he found it in the late thirties of the preceding century:

Forever afterward, Frémont remembered the rare beauty of the prairies as the gradual northern autumn came on, turning the aspen leaves to gold and the cottonwoods to silver, and brightening the far-spreading plain with clumps of sere buffalo grass and vari-colored flowers. The lowlands near the Renville post were sprinkled with purple asters and ablaze with goldenrod, for that year the prairie flowers were exceptionally luxuriant. On clear days the azure sky merged imperceptibly with the remote horizon, and distant objects trembled and loomed till their size could hardly be judged; in the warmth of Indian Summer smoke veiled the far-off swells, and gossamer drove before the breeze.

This probably is a valid description of what is now Southern Minnesota (not specifically the region embraced in Dodge County**) as the first settlers beheld it.

*From the History of Science Seminar (Eckman) of Richard E. Scammon, Ph.D., LL.D., Graduate School, University of Minnesota, Minneapolis.

†Division of Publications, the Mayo Clinic.

‡Sibley himself (reference 3) said the year was 1840, but in 1840 Frémont was not in the West. Professor Nevins (reference 2, p. 36, footnote) has written that the year 1838, which Frémont used in his *Memoirs*, should be accepted as the true one, although he noted that the year may have been 1839.

**Without doubt the region now included in Dodge County was well known to Dr. Lafayette Houghton Bunnell (1824-1903) of Winona, Minnesota, who among other exploits discovered the Yosemite Valley of California in March of 1851. For a complete life of this man, see: Kelly, H. A.: Lafayette Houghton Bunnell, M.D., Discoverer of the Yosemite, *Ann. Med. Hist.*, 3:179-193 (summer) 1921.

The Pioneer Era, 1854-1860

The first railway train to turn a wheel in Minnesota was pulled by the diminutive locomotive *William Crooks* from Saint Paul to Saint Anthony in the summer of 1862;⁴ the first enduring impress of civilization recorded in what is now Dodge County was made on April 14, 1854,* when "a company of homeseekers arrived at the present site of Mantorville; on the 15th they proceeded as far as Concord and camped for the night."⁵ The next day they erected a house at what is now Concord. It was the first habitation in the county.

How then did these people reach the inland fastness of the region now comprising Dodge County? Probably, at Rochester, they took a crude trail westward over the plains from the old stagecoach road which was opened in the early part of 1854 and which ran northward from Dubuque to the Iowa boundary and thence through Carimona,† Chatfield, Rochester, Zumbrota, Cannon Falls and Hastings.⁶ As a writer in the *Minnesota Democrat* is said⁶ to have observed in 1852: "The best route is from Dubuque north to the Iowa line, and thence into the Blue Earth and Cannon Valleys."

It has been shown⁶ that an early Minnesota physician, **Dr. William W. Finch**, was a commissioner who surveyed a territorial road which was laid out to follow the old traders' trail to Faribault's post and the Straight and Cedar Rivers to the Iowa line. Armstrong has shown that Doctor Finch was in practice in Saint Paul before November of 1853,⁷ that he was elected treasurer of Steele County in 1861,⁸ and that he died in Santa Barbara, California.⁸ Not much more is known about him.

The first settlers in Dodge County no doubt traversed the aforementioned stagecoach road from Dubuque, instead of going up the Mississippi River as far as Winona and then striking off westward overland, for there was no road from Winona to Rochester until 1855,⁶ although there seems to have been one from Red Wing through Oronoco** and thus into the county. Rochester, in fact, was platted as a town and marked off as a stagecoach station on the same day: July 25, 1854;⁶ but the stagecoach road in question was the one, previously referred to, which ran northward from Dubuque.

Larsen,⁶ in an admirable study of the region which included Dodge County in the period of its settlement, wrote:

To the south of those settlements (Saint Paul, Saint Anthony, Fort Snelling, Mendota, Stillwater) was a dense wilderness comprised within a triangle of land bounded by Iowa on the south, the Mississippi on the north and east, and the Minnesota and Blue Earth rivers on the north and west. Since immigrants arriving in Minnesota came first to this Triangle, it naturally was settled early in the territorial period. There was scarcely a trace of human habitation in the interior of the Triangle at the beginning of the fifties. Seminomadic Indians roamed over the region. At the junction of the Straight and Cannon rivers, in what became Rice County, a trader named Alexander Faribault had established a trading post in 1826, and there were temporary posts in other parts of the interior; but with these exceptions the wilderness was unbroken.

*Some of the men in the fall of 1853 had in fact penetrated to where Mantorville now stands, but they shortly returned to their homes in either Iowa or Pennsylvania (probably the former state) for the winter, settling permanently in Dodge County on the date named above.

†The Carimona House in what is now Fillmore County was a famous stagecoach inn of the period. Its register is now owned by the Minnesota Historical Society. See reference No. 10.

**Equipment for the *Mantorville Express* was brought by ox team into Dodge County by this route in 1857. At the ford on the Zumbro River near Oronoco some of the equipment fell into the river, thereby "wetting down" the paper for the first edition." See: History of Winona, Olmsted, and Dodge Counties, together with Biographical Matter, Statistics, Etc., Chicago, H. H. Hill & Co., 1884, p. 1246.

(To be continued in the March issue.)

All references will appear at the end of the completed chapter.

President's Letter

TANGIBLE RESULTS

TIME was, within the memory of many of our older members, when practically the only source of public information on matters relating to health was found in books like "Dr. Gunn's New Family Physician or Home Book of Health." Built on the generous lines of the family Bible, with gold embossed letters on the back, and a title page setting forth that the book "gives many valuable suggestions for avoiding disease and prolonging life, with plain directions in case of emergency, and pointing out in familiar language the causes, symptoms, treatment and cure of diseases incident to Men, Women and Children, with supplementary treatises on Anatomy, Physiology and Hygiene, and on Domestic and Sanitary Economy," these books were sold by "book agents" who went from house to house. A perusal of these books, even at the present day, discovers much useful and valuable advice, some philosophical in nature, some practical, and it is no part of my purpose to scoff at such books of instruction and guidance. They served a useful purpose in a period when medicine was regarded as something abstract and abstruse, the knowledge of which should be restricted to a select few, and which was shrouded in a certain mystery. This mystery was deepened by illegible prescriptions written in bad Latin, calling for bizarre and exotic drugs. The homely advice and common sense found in such books constituted a large part of the "public health education" of those days, and probably fairly represented the accepted medical practice of the period.

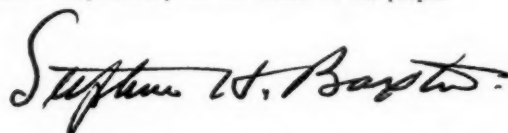
The mystery surrounding medical knowledge and the idea that only graduates in medicine should possess it, held back for many years any systematic or consistent efforts by competent, ethical physicians to educate the public in matters relating to sickness and health. All this is now changed, and private physicians, with the consent and approval of ethical medical organizations, may give popular lectures to all kinds of lay groups on a wide variety of medical subjects. Every avenue by which the public can be reached is now utilized for disseminating medical knowledge, and organized medicine has taken its full share of this task. Window displays have been prepared and distributed, spreading knowledge of cancer, tuberculosis, vaccination and immunization and nutrition. Pamphlets by the thousands have been distributed through doctors' offices giving information on nutrition.

Two radio programs are worthy of notice. Dr. O'Brien's programs combine scientific authenticity and accuracy with a clearness and skill in presentation that make them outstanding in the field of educational programs. Another radio program that deserves notice is called "World Health News," which is sponsored by the Hennepin County Tuberculosis Association. Since April, 1940, this program has given a weekly digest of articles pertaining to health which have appeared in various authoritative medical and scientific publications. The newspapers have done their share in the dissemination of medical knowledge.

Does all this effort pay in the form of tangible results?

A few weeks ago a healthy-appearing young man, twenty years of age, came to a doctor's office asking for a Wassermann test of his blood. Inquiry failed to elicit any history suggestive of syphilis, but the laboratory reported that the blood serum gave a positive reaction. This was confirmed by an independent report from another laboratory. Closer questioning brought out the history of a probable syphilitic infection about three years previously, all signs of which had disappeared spontaneously in a few weeks. Some information which this young man had received recently as a result of the campaign of public health education had recalled to his mind the incidents of three years ago and the result is that he is now taking a course of treatment with a good prospect of being cured.

This, of course, is no isolated case, but merely an example of what is doubtless happening every day in doctors' offices and in homes all over the country. Yes, all our efforts to educate the public to pay; we see fewer neglected, hopeless cases of cancer of the breast; mothers are learning not to give castor oil for the child's "stomach ache;" parents are anxious to have their children vaccinated and tuberculin-tested. The value of some kinds of advertising is difficult to determine, but public health education brings tangible results of great value to the individual and to the community and emphasizes the fact that the medical profession recognizes and is ready to assume its responsibility for the health of the people.



President, Minnesota State Medical Association

Editorial

CARL B. DRAKE, M.D., *Editor*; GEORGE EARL, M.D., HENRY L. ULRICH, M.D., *Associate Editors*

WAR AND DISEASE

DISEASE and pestilence associated with war have caused a greater toll of human life in all wars recorded in history than the conflict itself, with the possible exception of the Russo-Japanese war at the turn of the century. In most wars more of the armed forces have died from disease than from combat and if we include the loss of life in civilian population from pestilence spread by troops or incident to war, the grand total of loss of life from disease greatly exceeds that due to conflict alone.

What can we expect in regard to the factor of disease among our troops in the present world-wide conflict? Our troops are already in every quarter of the globe.

It is true that medical science has made great progress in the discovery of the cause of many diseases which will be encountered by our troops and personnel, their mode of transmission, means of preventing that transmission and specific remedies in a few instances. In the main, however, we shall have to rely on the prevention of infection rather than curative methods. And in war, preventive methods applicable to peace time obviously cannot be carried out.

Universal vaccination against typhoid, smallpox and tetanus is being used for all our troops. Those being sent to the tropics are receiving additional vaccination against yellow fever, typhus and cholera. Troops are being sent to regions where they will encounter malaria plague, amebic and bacillary dysentery, kala-azar, dengue fever, sandfly fever and helminthic infections, against which no vaccinations are available and general sanitary measures constitute the only defense.

Malaria fever constitutes a serious problem. Endemic in the tropics, mosquito control is impossible. Fortunately, the army was well stocked with quinine in advance. While the routine administration of quinine and the equally efficacious atabrine holds malaria symptoms in abeyance, it does not prevent infection and no doubt many troops will return infected with malaria. The anopheles mosquito, the vector of the disease, is

widespread in its distribution in this country, including Minnesota, and all we need is a few infected individuals to cause more or less of an epidemic in this state.

Bubonic plague should not prove a serious problem. We know it is spread by the rat flea and rigid measures against the landing of rats at our ports should prevent invasion of our country. We know, however, that there is a focus of the disease amongst the rodents in California which constitutes a constant threat to citizens in that state.

The control of amebic and bacillary dysentery lies in the protection of water and food, an impossibility in certain campaigns.

Fortunately, dengue and sandfly fever, although major causes of disease in some areas, are seldom fatal.

Yellow fever is endemic in South America. The *Aedes Aegypti* mosquito, which is the vector of the disease, is present, however, in the southern states and a few cases could conceivably start an epidemic. The prevention of importation of infected mosquitoes by airplanes arriving from South America is important. Vaccination has been accepted as effective, although certain batches of vaccine produced jaundice weeks to months after administration, with considerable disability, and even a mortality of 0.2 per cent of hospitalized cases. While the cause of the severe reactions has not been completely determined, the elimination of human serum in the preparation of the vaccine seems to have eliminated the reactions. Only troops going to South America and central regions of Africa are inoculated.

Typhus fever can be prevented largely by controlling infestation with the body louse. The disease at present is in evidence on the Russian front and in northern Africa where last year severe epidemics occurred from Morocco to Egypt. The effectiveness of inoculation has yet to be confirmed. We have had small epidemics of typhus fever in this country. Several years ago a number of cases of Brill's disease

appeared in New York City which proved to be typhus. As recent as 1939 one hundred cases of typhus developed in localized areas of Nashville, Tennessee. It seems that endemic typhus is spread by the rat flea and the extermination of rats in certain areas of Nashville terminated the small epidemic.

Cholera resembles typhoid fever in its symptoms and mode of spread. Epidemic invasion of this country by the disease should be easily prevented because of the short incubation time of one to three days and the long period of travel necessary from the Far East to our shores.

Medical science will do more in the present conflict to prevent disease and wounds from exacting as great a toll amongst our armed forces as in previous wars. The sulfo dyes are a valuable addition in the treatment of war wounds. The availability of blood plasma in large amounts for blood replacement is also new and most valuable. We are fortunate in having an enlightened and efficient Medical Corps augmented by more than 40,000 of our best civilian surgeons and medical men who will do much to mitigate the ravages of war and disease.

DOCTOR, SAVE OUR MILEAGE!

CIVILIAN travel by automobile is absolutely essential to the war effort. Seven out of ten industrial workers have to ride to work by private car. Streetcars, trains, and busses can't carry them. The public means of transportation are already overcrowded, and still three-fourths of all travel is by privately-owned automobiles.

So it isn't a question of automobiles or some other form of transportation. For most of us it is a question of automobiles or no transportation at all.

Mileage is being rationed—not because we haven't plenty of gasoline—but because our rubber situation is so extremely critical that drastic measures are necessary to conserve every precious ounce of rubber and every existing tire in the country.

The mileage that remains in our cars and in our tires is essential transportation. To win the war, the country needs this mileage just as it needs steel and aluminum, or planes and ships.

Need the doctor with his "C" book be concerned with mileage rationing? Isn't he in a

privileged class so far as gasoline and tires are concerned?

In recognition of the importance from the community standpoint of the doctor's being able to make necessary professional calls, he is made eligible for "preferred mileage" for that purpose and for that purpose only. The law says "for making necessary professional calls outside of his office if he regularly makes such calls and for travel between offices maintained by him."

A doctor is not automatically entitled to a "C" book. The type of ration coupon book he receives depends primarily on the mileage he actually needs for making necessary professional calls. Some doctors will need less than others. The professional needs of some doctors can be taken care of within the occupational mileage of 470 miles per month afforded by a "B" book. Whether the doctor's car carries a "B" sticker or a "C" sticker, he is allowed only 90 miles of personal and family driving per month, because anyone receiving either a "B" or a "C" book and sticker is expected to use 150 of the 240 miles of driving a month on his "A" book for occupational purposes. And if there is a second car in the family not being used principally for someone else's occupational driving, the doctor is expected to use that to the extent of 150 miles per month with its "A" book.

Except for the "preferred mileage" allowed for the making of necessary professional calls, the doctor has no greater driving privileges than his layman neighbor—and properly so.

There is a notion, more widespread among layman than among doctors, that a "C" sticker on the windshield of a doctor's car means unlimited personal driving not only for the doctor but for all other members of the doctor's family. It is regrettable if any doctors, unintentionally or otherwise, have overstated their actual mileage needs for making necessary professional calls and permitted the use of their cars to lend credence to any such notion. Such practices will only reflect against the integrity of the individual doctor and the standing of the profession.

Tires are what the new mileage rationing program is designed to conserve. With the available supply of new regular tires being rapidly diminished, the emphasis is laid on the care and preservation of our present tires, on the prolonging of their useful lives through reduction in speed, periodic inspections, and timely recap-

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ping as needed. Where, through no fault of the car owner a tire must be replaced, the type of replacement tire allowed for the particular car depends upon the mileage which has been allotted. The holder of an "A" book only or the holder of an "A" and a "B" book may be eligible for a so-called Grade III tire, which is either a used tire, a recapped tire, or a War tire made of reclaimed rubber. The "C" book holder, when eligible for a replacement tire, may receive a new Grade II or Grade I "pre-war" tire depending on whether his allowed mileage is more or less than 1,000 miles per month.

Applications for tires or recapping services are made with the Local War Price and Rationing Boards. These Boards receive very limited monthly quotas of tires which they cannot exceed, so eligibility for a replacement tire in no way gives any assurance that a tire may be received. This is an additional reason for taking the very best care of one's present tires.

We are assured that every effort will be made to provide doctors with tires needed for making necessary professional calls. Because of the war emergency, no better grade tire and no more rubber can be provided than is absolutely needed for essential travel.

Transportation is a vital war commodity. Doctors can and will do their part in eliminating nonessential mileage.

HUGH W. BROOKS

Office of Price Administration
State Rationing Attorney

WITH CLUBS IT'S LEGAL

A farmer or other producer hauling his produce into New York City must stop at the city line to take on and pay a member of the local teamsters' union. Truck owners who have resisted paying this tribute have suffered damage to their vehicles and the destruction of their cargoes. The Supreme Court of the United States recently ruled that so far as federal statutes went these union activities were perfectly legal and the federal Government could not interfere with them. The consumers of New York pay this union tribute in higher prices.

Organized physicians in the city of Washington, D. C., conspired to interfere with the operations of a cooperative organization to give cheap medical attention and hospitalization to its members who were Government employees. The physicians were charged with attempting to prevent the members of their association from accepting employment under the group health plan and to restrain hospitals from affording facilities

to patients of physicians employed under the group plan. The Supreme Court ruled that the organized physicians violated the Sherman anti-trust act.

We do not raise the question as to whether the court correctly interpreted the law in each case.

Apparently the Washington physicians went about this thing in the wrong way. They should have organized a union. The union officials would then hire a group of plug-uglies. These goons could then have beaten up the physicians who did not conform to union rules. They could have picketed the hospitals and refused to let supplies be taken to them.

In all of these activities they would have been immune from federal prosecution. Of course, the local police might have become inquisitive but who in recent years has heard of local police daring to interfere with the activities of union picket lines? What reason is there to believe that Washington, where unions have such powerful friends, would be an exception?

Well, at any rate the good doctors of Washington now know who constitute the "underprivileged."—*Wall Street Journal*, December 20, 1942.

THE TAX ON NON-GIVING

Every minister and every church finance committee should understand the interrelation of taxes and giving.

The important fact is that (up to 15 per cent of his taxable income) the American citizen's gifts represent an *untaxed* part of his income, 100 per cent at his own disposal. It is a long-accepted principle of income taxation that the impulse to give to social and religious purposes should not be penalized by taxation.

Under the new high tax schedules this is more important than ever before. A part of every dollar given to religious, charitable, educational and similar institutions is money which would otherwise go to the Collector of Internal Revenue, the part varying from 24 per cent on an \$800 net income or 31 per cent on a \$5,000 net income, to 51 per cent on a \$15,000 income and 88 per cent on a \$100,000 income.

Put in another way, it may be said that the government contributes a part of every dollar disbursed as such gifts. To illustrate: Mr. X, having a net income of \$2,000, considers a \$100 gift to the church; decides against it; keeps the \$100. The tax collector, however, takes \$24.00 of the \$100. Mr. X retains the balance, but it is then clear to him that if he had made the gift, \$24 of it would in effect have been absorbed by the Treasury.

Even more striking is the fact that in the same way a corporation subject to excess profits tax makes a contribution of \$1,000 at a net cost to itself of only \$190, the balance of \$810 being the sum which would otherwise be paid in taxes.

We are not emphasizing tax avoidance; we are stressing the fact that the work of the church is supremely important, its financial support essential, and that the government encourages giving by allowing an equivalent deduction from taxable income up to a limit of 15 per cent of net total income. The same principle applies in Canada.

Between now and the year-end, remind your friends that there is a heavy tax on "non-giving"!—*Ministers Life and Casualty Call*, December, 1942.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association
George Earl, M.D., Chairman

PLANNING FOR THE FUTURE OF MEDICINE

POSTWAR planning requires no coupons. It is not a rationed indulgence and statesmen, economists, scientists, editors and philosophers are all busy sketching their own pictures of the world to come. Some of these pictures are obviously in the realm of fantasy. But all assume, as a matter of course, that great changes are inevitable and that they will come about with a speed for which there is no recorded precedent in history.

We are virtually promised a new era in transportation as soon as the treaties are signed—rear-engined automobiles of unimagined performance and private planes which rise vertically into the air from backyard hangars.

Governor Stassen proposes a world parliament and a world police force to keep men at peace and trade lanes open.

"Production for Employment"

President Roosevelt is said, on good authority, to be ready to propose a plan for postwar jobs on a scale that would utterly eclipse WPA in its heyday. The motto will be "production for employment," not production for profit and every industry will be required to hire its allotment of workers regardless of funds to meet the payroll. If profits are lacking the government will step in and buy the goods.

No major prophet in America has so far blue-printed medicine in this world to come. But minor prophets with plans for a new era in medicine are legion. In England, of course, the Beveridge report has already called for vast extensions of health insurance. It envisions government hospitals as health centers of every community after the war.

Will the major planners in America leave medical practice out of their calculations? It seems hardly likely.

True, the new Congress will not be so friendly to social experiment as immediate predecessors. It should be remembered, however, that many a planner in Washington is in a position to give considerable substance to his ideas without benefit of Congress.

Impossible to Ignore

It is true, also, that the end of the war is likely to see a reaction such as followed World War I against war and all of its works. But public reaction will not be able to camouflage the toughest economic problems the world has ever faced. The most reactionary administration it is possible to conceive in Washington will not succeed in ignoring demands for jobs and security from millions of returning soldiers and millions of discharged war workers. Lacking a new continent to develop, some social and economic planning will be forced upon the government in Washington regardless of the complexion of its politics at home. And it is inconceivable that anything so intimately bound up with public welfare as medical service will escape considerable change and adjustment.

Whether qualified physicians or Washington bureaucrats plan these adjustments and put them into effect, depends largely upon the attitudes and policies of physicians themselves, now, as well as later when the crisis is upon them. They too must take a hand in the planning and sit in the counsels of the planners.

Physicians Can Lose

Medical association officials have sometimes appeared in the public eye as mere obstructionists, stubbornly and blindly combating change. It is self-evident that no one wins a battle against time and tide and the forces of social evolution. But by the same token, physicians, their traditions and their standards, can lose and lose trag-

ically if they fail to take a wise and responsible hand in shaping events to come.

For that reason, the program arranged for the 17th National Conference on Medical Services to be held Sunday, February 14, at the Palmer House in Chicago is of the greatest interest and importance.

Medical Participation to be Planned

The program is comprised of two symposiums entitled, respectively, "An Analysis of Current Trends in the Control of Medicine" and "Medicine in the Postwar Era." Medical association officers, delegates and committees from all over the country will engage in these discussions. Out of them should come some realistic and sound policies to guide their participation in the America to come.

Every physician who can possibly spare the time should attend this meeting and take part in these important discussions.

MEDICAL AND HOSPITAL OBSTETRIC AND PEDIATRIC CARE FOR WIVES AND INFANTS OF MEN IN MILITARY SERVICE

Note.—The information printed below was provided by Dr. A. J. Chesley, secretary and executive officer of the Minnesota Department of Health after consultation with the Committee on Child Health and the Council.—THE EDITORS.

The Minnesota Department of Health has a limited fund, in the amount of \$10,000, allotted by the United States Children's Bureau under the terms of the Federal Social Security Act, to provide the medical and hospital obstetric and pediatric care needed by the wives and infants of men in the military service. As you will note, only \$10,000 is available now and we have no information as to what funds the Children's Bureau may make available in the future. In recognition of the limitations of this fund, it is urged that all claims on it be made with discretion and thoughtfulness. Furthermore, the provisions of this program cannot be made retroactive. Applications will be accepted only for patients currently receiving medical care and until the fund is exhausted.

Eligibility

All expectant mothers living in Minnesota, irrespective of legal residence, who state that the father of the expected child is in military service

(U. S. Army or U. S. Navy, including Marine Corps or Coast Guard) and not a commissioned officer, are eligible for financial assistance with medical and hospital obstetric care without cost to the family whenever such care is not available from Army or Navy physicians and hospitals and tax-supported prenatal and pediatric clinics or hospitals. Unmarried expectant mothers will be included in this program in accordance with plans for their care developed by the State Division of Social Welfare and, therefore, the unmarried expectant mother should be referred to the County Welfare Board in the usual manner.

Any child under one year of age living in Minnesota, irrespective of legal residence, whose father is in military service, but not a commissioned officer, is eligible for pediatric medical and hospital care, including well-baby care and care during sickness, without cost to the family whenever such care is not available from Army or Navy physicians and hospitals and tax-supported pediatric clinics or hospitals.

Applications

Applications for these services are to be submitted jointly by the patient and the physician of her choice as soon as possible after care begins.

Three application forms are provided: (1) for medical and/or hospital maternity care; (2) for well-baby medical care; (3) for medical and/or hospital care of child during illness. The last form should be submitted for each individual illness or hospitalization. These forms are obtainable from the Division of Child Welfare, Minnesota Department of Health, University Campus, Minneapolis, and are to be submitted directly to that division.

Authorization

Such applications will be approved for payment when the medical services are to be rendered by Doctors of Medicine licensed in Minnesota by the State Board of Medical Examiners and when hospitalization is to be provided in an institution licensed for the purpose by the Minnesota Department of Health. It is requested that the least expensive available hospital facility be used, i.e., ward beds or semi-private rooms in preference to a private room. Private room care will be authorized for the patient whose condition requires it. Notification that payment is authorized will be sent immediately after approval to

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the attending physician, patient, and hospital—if hospital care is recommended by the attending physician. The case will then be referred to the local public health nurse with a request that she contact the attending physician to ascertain whether her services may be of assistance in the care of the patient.

Payments

Payments for medical and hospital care will be made only if previously authorized.

Payments to physicians for medical services will be made by the Division of Child Hygiene, Minnesota Department of Health, at the termination of care and when a satisfactory maternity or pediatric record is submitted on forms supplied for the purpose. These payments will be made in conformity with the fee schedule recommended for use in this program by the Minnesota State Medical Association. The fee schedule is attached herewith.

Payments for hospital obstetric and pediatric care will be made by the Division of Child Hygiene, Minnesota Department of Health, at the per diem rate of the hospital concerned upon receipt of a satisfactory record of services rendered. Forms are supplied for this purpose.

Medical Consultation

Physicians desiring medical consultation in the care of these patients are directed to apply to the County Medical Advisory Committee. The consultant will be paid the fee provided in the attached fee schedule.

MEDICAL FEE SCHEDULE FOR MEDICAL AND HOSPITAL OBSTETRIC AND PEDIATRIC CARE FOR WIVES AND INFANTS OF MEN IN MILITARY SERVICE

From the Schedule of Allowances Approved for the Use of the Division of Social Welfare by the Medical Advisory Committee

The complete fee schedule contains 206 items but only the fees for the usual medical obstetric and infant care procedures are included in this list. Fees for other procedures will be supplied to physicians on request.

General

Call (country, day) per mile \$1.00 first ten, then \$.50 per mile.	
Call (country, night)—\$1.00 plus mileage.	
Call (town, day).....	\$ 2.00
Call (town, night).....	3.00
Call (hospital)	2.00

Call (hospital—out of town doctors).....	3.00
Call (office, with 2 laboratory procedures).....	2.00
Call (office—routine).....	1.00
Consultation (plus mileage charge).....	5.00
Intramuscular therapy.....	2.00
Intravenous therapy	3.00

Obstetrics

Abortion (therapeutic).....	50.00
Bag insertion during labor; add to suggested allowance	10.00
Cesarean section.....	150.00
Delivery, normal, home, plus mileage.....	25.00
Delivery, normal, hospital.....	25.00
Ectopic pregnancy.....	150.00
Forceps delivery; add to suggested allowance....	5.00
Miscarriage	25.00
Obstetrical consultation, plus mileage.....	5.00
Obstetrical version and extraction; additional charge	25.00

Immunizations—Complete Course

Diphtheria	2.00
Smallpox	1.00

Laboratory Work

Basal metabolism rate.....	5.00
Blood cell count (red).....	1.00
Blood cell count (white	1.00
Blood count (differential).....	2.00
Blood culture.....	5.00
Blood sugar (single test).....	3.00
Blood sugar (tolerance test).....	5.00
Electrocardiogram (including interpretation)....	6.00
Hemoglobin determination (Dare, Sahli).....	1.00
Phenolsulfonphthalein test	5.00
Sedimentation rate (blood).....	3.00
Urinalysis	1.00
Venous blood for diagnostic tests.....	2.00

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

Minneapolis Chiropractor Loses Basic Science Certificate and Chiropractic License

Re: State of Minnesota vs. Henry Wuerzinger

On January 12, 1943, Henry Wuerzinger, seventy-nine years of age, residing at 3453 Stevens Avenue South, Minneapolis, entered a plea of guilty in the District Court of Hennepin County, to an information charging him with the crime of practicing medicine without a license. Wuerzinger, a licensed chiropractor, was sentenced by the Honorable A. W. Selover, Judge of the District Court, to a term of one year in the County Jail of Hennepin County. The defendant was placed on probation for three years on the following conditions:

1. Defendant must surrender, for cancellation, his Minnesota Basic Science Certificate and his Minnesota Chiropractic License.
2. The defendant's medical and surgical equipment seized by the Minneapolis Police Department is to be turned over to Minneapolis General Hospital.

MINNESOTA MEDICINE

MEDICAL ECONOMICS

3. The promissory note in the sum of \$75.00 obtained by the defendant from the patient at the time of the alleged abortion, is to be returned to the patient for cancellation.

Wuerzinger was arrested on October 8, 1942, following an investigation of his activities by the Women's Bureau of the Minneapolis Police Department and a representative of the Minnesota State Board of Medical Examiners. During the course of this investigation a twenty-two-year old unmarried Minneapolis girl stated that Wuerzinger had performed a criminal abortion upon her on June 23, 1942, at his then residence, 3859 Second Avenue South, Minneapolis. The patient stated that Wuerzinger charged her \$125.00 in cash, and in addition thereto, demanded a promissory note from her for \$75.00 dated July 1, and payable in fifteen days. When the police arrested the defendant at his home they seized Wuerzinger's examining table, surgical instruments, medicinal preparations and other similar articles. The police also discovered in Wuerzinger's possession, the \$75.00 note executed by the patient. Following his arraignment in Court, the defendant insisted that he was too sick to stand trial. However, the examining physician stated that Wuerzinger was able to stand trial and the Court ordered the case set for January 12, 1943. Because of the defendant's age and the condition of his health, he was permitted by the Court, upon the recommendation of the County Attorney's Office and the Minnesota State Board of Medical Examiners, to plead guilty to the lesser charge.

Wuerzinger, according to the records of the Minnesota State Board of Medical Examiners, has been in Minnesota since 1907. During many of these years the defendant represented himself as a physician and surgeon, although the only license he ever held in Minnesota was a chiropractic license issued to him in 1919, by exemption. Wuerzinger also received his Basic Science Certificate in the same manner in 1927. He was indicted by the grand jury of Hennepin County in December, 1935, and charged with manslaughter in the first degree following the death of a Hopkins, Minnesota, woman, who stated that Wuerzinger had performed a criminal abortion upon her. Wuerzinger was never brought to trial in that case because of his alleged ill health.

The Minnesota State Board of Medical Examiners wishes to emphasize the splendid work done by the Women's Bureau of the Minneapolis Police Department in this case. The police women, under the able leadership of Lieutenant Blanche Jones, made a thorough investigation into the facts surrounding this case. Because of their vigilance the police discovered the \$75.00 promissory note given Wuerzinger by the patient. This was the most valuable single item of evidence obtained by the State. The evidence obtained was undoubtedly a large factor in prompting Wuerzinger to offer to plead guilty to the lesser charge. The Minnesota State Board of Medical Examiners also appreciates the fine spirit of cooperation shown by the new County Attorney of Hennepin County, Mr. Michael J. Dillon, and his assistants, Mr. Peter S. Neilson and Howard Van Lear. Their insistence that his case be tried contributed greatly to the results accomplished.

Minneapolis Abortionist Sentenced to Four-Year Prison Term

Re: State of Minnesota vs. (Mrs.) Sophia Peck

On January 2, 1943, Sophia Peck, sixty-two years of age, was sentenced by the Honorable Frank E. Reed, Judge of the District Court of Hennepin County, to a term of not to exceed 4 years at hard labor in the Women's Reformatory at Shakopee, Minnesota. Mrs. Peck was convicted by a jury on December 3, 1942, of the crime of abortion.

The testimony at the trial showed that the defendant

attempted to perform an abortion on an unmarried Minneapolis girl on July 17, 1942, by the use of a rubber catheter. The attempted abortion was a failure and the same procedure was repeated again on September 19, and September 24. The patient became seriously ill and was hospitalized twice in October. She subsequently recovered and testified for the State at the trial. The State also had as evidence catheters, instruments and medicinal preparations seized by the Women's Bureau of the Minneapolis Police Department at the time the defendant was arrested. The defendant told the Court that she was a tailor by occupation but had also engaged in the selling of cosmetics. Mrs. Peck holds no license to practice any form of healing in Minnesota, and at the time of her arrest resided at 59 North 15th Street, Minneapolis. Mrs. Peck was tried for a similar offense in October, 1937, but was found not guilty by a jury.

HEAR DISEASE NO BAR TO INDUSTRIAL EMPLOYMENT

Heart disease need not bar the patient in every case from industrial employment. Many thousands of heart patients and probably most of the 10 per cent or so of young men rejected for the army because of heart and blood vessel disease would qualify physically for positions in industry.

Statements to this effect were made by both Dr. Rufus B. Crain, of Rochester, N. Y., and Dr. O. F. Hedley, of the U. S. Public Health Service, before the committee on cardiac clinics of the New York Tuberculosis and Health Association.

From experience at the Eastman Kodak Company, Dr. Crain reported evidence that "with careful placement and medical supervision" persons with heart disease and high blood pressure "can be continued in employment without risk."

"This experience should encourage the hiring of individuals in the same category as new employees," he declared.

The right to work when physically handicapped is one of the practical, far-reaching gains for labor and society which is being reached through the war and which should be held after the war, Dr. Hedley pointed out.

In the case of heart disease the importance of continuing to make it possible for the patients to work can hardly be exaggerated, because with the aging of the population, the numbers with heart disease will continue to increase.

In the future, society will be faced with the choice of obtaining employment for the increasing group of heart disease patients or otherwise providing a means of livelihood through some form of taxation.—*Science News Letter*, January 30, 1943.

PERSIMMON LEAVES RICH IN VITAMIN C

When tea joins coffee on the list of scarcities, don't worry. Brew yourself a tasty cup from persimmon leaves—if you live where persimmons grow. It's good for you; full of scurvy-preventing vitamin C.

Prof. C. G. Vinson of the University of Missouri and Prof. F. B. Cross of Oklahoma A. and M. College report (*Science*, Nov. 6), that green persimmon leaves are rich in this essential vitamin. Freshly dried leaves sometimes have an even higher concentration. Green fruits also contain the vitamin, though not as much of it as the leaves; the vitamin apparently disappears to a large extent as the fruit ripens.

Tea made from chopped-up dried leaves was found to be a good vitamin source, and tasted rather well with a little sugar—"Similar to sassafras tea." Real tea was also tested, but proved to have only about 7 per cent as much vitamin C as the decoction from persimmon leaves.—*Science News Letter*, November 28, 1942.

INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases

A. E. Wilcox, Minneapolis, Chairman

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Martin Aune, Minneapolis
Richard Bardon, Duluth

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FITTING WORKERS TO THEIR JOBS

Clerical workers and executives in industry have probably enjoyed less than their share of benefits from modern medical services in industry according to Dr. T. Lyle Hazlett, medical director of the Westinghouse Electric and Manufacturing company, whose article on the subject, "What Are We Examining For," appeared in the December issue of *Industrial Medicine*.

Executives Studied, Too

Of especial interest was a survey described by Dr. Hazlett of the cardiovascular condition of 692 executives between the ages of 30 and 67 in the Westinghouse employ.

The study included electrocardiograms, blood pressure determinations, fluoroscopy for the study of cardiac contours, cardiac auscultation and urinalysis.

"It was found," Dr. Hazlett reported, "that over 13 per cent of the group exhibited one or more abnormal findings. Over 11 per cent of the electrocardiograms revealed abnormalities; the blood pressure was found elevated in 7.6 per cent; fluoroscopy revealed abnormal heart contour in 9.2 per cent; auscultation showed four per cent to have significant cardiac murmurs and urinalyses were positive in four per cent. Of the latter, eight cases exhibited glycosuria which had been previously unsuspected. These findings would appear to suggest advisability of universal periodic examinations for workers in all divisions of industry. Such examinations should, as a rule, be of general character and not limited to one system."

Psychiatric Aspect Important

Dr. Hazlett also emphasized the importance of the psychiatric aspect of the industrial medical examination. This phase of the examination deals with the personality type and studies the individual from the point of view of emotional and intellectual traits. It is especially necessary,

he believes, in this period of strain. The balanced personality with adequate social adjustments obviously brings to his job and to his vocational contacts qualities which are distinct assets both to his personal contentment and to his vocational success. "At present," he says, "little attention is paid to psychiatric factors; only the most marked abnormalities are apt to strike the examiner's attention.

"I mention this matter as a desirable element to develop in our examinations. Then, in passing, I should like to mention psychological tests of such traits as mechanical aptitudes, skill in certain types of performance, extent of information in certain subjects. These latter tests may well contribute to a more complete knowledge of the individual potentialities."

Pre-Placement Objective

The pre-placement examination, according to Dr. Hazlett, has for its major objective the assurance of the utmost degree of compatibility between the worker and his job, not only from the standpoint of job efficiency but from the standpoint of industrial hazards.

There are two aspects to this question. One deals with physical conditions which may be aggravated by certain types of work and the other with physical defects which will increase the accident hazard not only to the worker himself but to fellow workers as well.

"In the first class," he says, "we find the silicotic patient who, by continued exposure to silica dust, is under greater menace of tuberculous infection than the applicant with reduced vision, abnormal hearing, epilepsy and psychoneurotic traits. It must not be forgotten that, even with the best mechanical safeguards, the possibility of accidents exists and, in the majority of cases, the human factor and not the mechanical one, determines whether an accident will or will not occur. . . . This does not imply that the pre-

(Continued on page 222)

Minnesota Academy of Medicine

Meeting of October 14, 1942

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 14, 1942. The meeting was called to order at 7:40 p.m. by the president, Dr. Martin Nordland.

There were forty-eight members and two guests present.

Minutes of the May meeting were read and approved. The scientific program followed.

THE MEDICAL MANAGEMENT OF PEPTIC ULCER

(Abstract)

MOSES BARRON, M.D.
Minneapolis, Minnesota

Treatment of uncomplicated peptic ulcer is practically always medical. Only certain complications are to be considered surgical. Rarely do the symptoms of uncomplicated ulcer persist after appropriate medical management so that surgery has to be resorted to. Peptic ulcer is one of the common causes of gastric complaints. In people over forty gall bladder causes distress more often than ulcer, especially in women. Most ulcers are duodenal, only about 5 to 6 per cent being gastric. Clinical ulcers are much more common in males than in females, about 85 per cent occurring in males. Gastric ulcers occur more commonly after the age of forty while more than 50 per cent of duodenal occur under the age of thirty. The exact etiology is not known but constitution and heredity are important factors. Many theories have been brought forth to explain ulcer development such as certain vascular changes, alterations in the nerve supply, focal infections and localized trauma from foods. The only almost constant finding associated with ulcers is acidity. Usually this is in excess. The importance of the acid secretion in the formation of clinical ulcers has been demonstrated experimentally by the production of ulcers in laboratory and domestic animals through repeated administration of histamine. Also the hyperacidity resulting from repeated and continuous stimulation of the vagus as well as the acidity induced by sham feeding produce ulcers in dogs. Wolf and Wolff¹ present an interesting study in the development of peptic ulcer in man. They show the relationship of anxiety and conflict to overactivity and hypersecretion in the stomach and the effect of this in turn on the development of ulcer. Such ulcers may finally progress to hemorrhage or perforation. Gastric ulcer may develop in cases of anacidity but these heal without producing clinical symptoms. As an illustration one never finds clinical ulcers developing in patients with pernicious

anemia in whom, as is well known, achylia gastrica is always present. Since all ulcers probably start as simple erosions the presence of acid seems to be a factor sine qua non for the prevention of healing. Trauma from food may also be a factor. This is especially true if the gastric contents is projected against a particular area of the mucosa. The bolting of coarse food may add to the difficulty. I believe that not enough attention has been paid to the psychoneurogenic factors. It is quite apparent to everyone dealing with ulcer patients that they constitute a class notoriously highstrung, aggressive, sensitive and irritable. Some authorities claim that there is an association between the development of ulcers and lesions in the region of the pituitary and hypothalamus.

It is an interesting observation that perforations occur in men twenty-five times more frequently than in women. Fatal hemorrhages are also much more common in men. This in view of the fact that careful post-mortem studies of the stomachs have shown that asymptomatic erosions and small ulcers are even more common in young women than in men. They seem to heal before symptoms or chronicity develop.

It has been shown that in the treatment of peptic ulcer if alkali is used the duration of pain averages 2.8 days, but with the same diet, if beef extract is used the average duration of pain is twenty-six days. Worry, nervous strain, exertion and over-work tend to increase gastric secretion and therefore also the pain. The vitamin deficiencies of B₁ and A play apparently an unimportant part in the causation of ulcer. These deficiencies produce hypochlohydria and anorexia. Pure gastric juice has a capacity to destroy and digest living tissues, but when mixed and diluted with gastric contents it becomes practically inert toward such tissues. Whenever there is excessive secretion even during rest the healing of the ulcer is inhibited or delayed.

Pathogenesis.—Peptic erosions are common in many individuals and in the stomach are often multiple. These at first are superficial and heal readily without scarring unless certain factors delay it. Clinical duodenal ulcers occur mostly in males between twenty and fifty years. Most stomach ulcers are on the posterior wall of the lesser curvature, several inches above the pylorus. Duodenal ulcers become deep seated and develop intragastric and perigastric reactions. Since the gastric secretion has a corrosive action in producing the clinical ulcers, treatment resolves itself mostly to reducing and eliminating the acid.

Diagnosis.—Peptic ulcer is a common disease too frequently mismanaged. Too long delayed or improper treatment is probably the greatest cause of the com-

plications which may later necessitate surgical intervention. A careful detailed twenty-four hour history is important for diagnosis. X-ray studies are important to corroborate the diagnosis which can usually be arrived at from a careful history together with gastric analysis. The physical examination reveals little in ulcer except inconstant tenderness in the epigastrium.

Symptoms.—Pain in the epigastrium, gnawing, burning-like hunger pains from one to four hours after meals, with heartburn and gas distress and often sour eructations suggest the presence of ulcers. The distress is present when the stomach is empty and is usually relieved by food and antacid. Symptoms of activity may last from several weeks to several months, followed by prolonged and complete remissions.

Treatment.—In few diseases is it so important to get complete coöperation of the patient through a careful and detailed explanation of the rationale of the management. Most cases can be treated ambulatory with as good results as with complete rest in bed.

Diet.—A graduated diet which begins with milk, cereals, soft-boiled eggs and toast and which is gradually increased by adding more of the bland and less irritating foods forms the basis of the dietary management. The food should be well cooked and given in small amounts. Coarse rough foods, raw vegetables, nuts, mustard, catsup, condiments and highly seasoned foods must be avoided indefinitely. From one to four teaspoons of olive oil given before meals is of value as it helps inhibit gastric secretion. At first feedings principally of milk are given every hour, after about four weeks every two hours, and after two months three principal meals together with milk between meals and at bedtime. A special diet sheet giving foods permissible for a period of about two months should form the basis of ambulatory management.

Medication.—The old Sippy powders given twelve to fourteen times a day are no longer necessary. Many cases fared badly under that management because of either the development of alkalosis or the production of an acid rebound following some of the doses of alkali. Alkaline powders may be given after each of three meals and once or twice in the evening. With the milk at the hour feedings atropine in solution, about 1-125 gr., should be given four times during the day; also Amphojel or Creamalin should be given four or five times during the day in two teaspoon doses. Alutropin, preparations of magnesium trisilicate and Malcogel, may be substituted for the Amphojel. Concentrated vitamins, especially containing large doses of B and C, should be administered because of the restricted diet. If anemia is present iron should be administered. Benzedrine in 10 mgm. doses is very good for spasm. The patient should be under strict management for at least six months and after that under careful observation for at least a year. At first the patient should consult the doctor about once a week. If stomach distress should return at any time the patient should place himself at once on the second or third week diet.

Complications.—Many of the complications are surgical in nature. The most common one is partial or complete obstruction. This may be due to spasm, inflammatory edema or scarring. Careful management with large doses of atropine should relieve the obstruction very promptly if it is not due to scarring. For the latter surgery is indicated. The most characteristic symptom of obstruction is ulcer distress at a time when the stomach should be empty. In severe obstruction there is usually anorexia, epigastric fullness, nausea, vomiting and in thin individuals visible peristalsis. Midnight or early morning distress suggests gastric retention. The x-ray helps to establish the diagnosis. The next important complication is hemorrhage. Massive hemorrhages occur in asymptomatic ulcers in 50 per cent of the cases. The symptoms are weakness, breathlessness, fainting, hematemesis and tarry stools, also a posthemorrhagic anemia. Patients under forty-five years usually respond to medical management; in those over forty-five surgery is often necessary because of the tendency to fatal hemorrhage. The next important complication is perforation. The symptoms may be sudden, agonizing pains in the epigastrium with board-like rigidity. Slow perforations may occur in the posterior wall of the duodenum with pain, localized tenderness, fever and leukocytosis. The treatment is surgical.

Conclusions.—The management of peptic ulcer is medical, but many of the severe complications are surgical. For most cases ambulatory management is very satisfactory. The patient's confidence and co-operation must be obtained by careful explanation of the rationale of the treatment. Hyperacidity nearly always accompanies peptic ulcer. It apparently plays an important part in the production of clinical ulcers. Neutralizing mixtures are replacing the strong alkaline powders formerly used in the treatment of ulcer. In the early phase of this treatment patients should visit their physician frequently. Ulcers with obstructive symptoms should first be given thorough medical management before advising surgery. Surgery should be considered early in cases when massive hemorrhage occurs in patients over forty-five years old. The present-day medical management of uncomplicated duodenal ulcer brings gratifying results. Gastric ulcer because of the accompanying fibrosis and the possibility of superimposition of malignancy is more often surgical.

Reference

1. Wolf, Stuart, and Wolff, Harold G.: Genesis of peptic ulcer in man. *Jour. A.M.A.*, 120:670-675, (Oct. 31) 1942.

THE SURGICAL MANAGEMENT OF PEPTIC ULCER—A CHEMICAL PROBLEM

(Abstract)

O. H. WANGENSTEEN, M.D.
Minneapolis, Minnesota

Surgery enjoys an important role in the management of ulcer, only because of ineffective and inadequate control of gastric acidity by conservative means. In other words, the surgical management of ulcer begins

with medical failures. The patient with an ulcer who is being managed satisfactorily by a dietary regimen is not a candidate for surgery. When sure and effective depressants of gastric acidity become available, the role of the surgeon in the management of ulcer will become a less important one than it is now. Surgeons who operate for the relief of ulcer will be the first to make this concession.

The frequency with which ulcer looms as a medical problem in the military forces indicates that the management of ulcer is a very live question. The medical military experience of the English and the Canadians in the present conflict suggests that, next to flat feet, ulcer is the most frequent cause of disability amongst enlisted men. Our own Medical Department is encountering ulcer as a frequent problem in the Armed Forces.

Operative procedures directed at the relief of ulcer which fail to reduce gastric acidity are potentially dangerous and should be abandoned. Only an extensive gastric resection (three-quarter resection) with complete excision of the antral mucosa affords real promise of effectual reduction of gastric acidity, the *sine qua non* of a satisfactory operation for ulcer. This operation can be done as a one-stage procedure in all ulcers (except acute perforation) and with minimal mortality (2 to 3 per cent). This procedure appears to rid the patient for good and all of the ulcer diathesis. As far as is known now, it does not compromise the future for him in any important manner. After the lapse of a few months (three to four) the gastric capacity of these patients becomes quite normal again. During that interval, it is important that the patient eat often. No other dietary strictures are enjoined on the patient. Meat, vegetables and fruit which ulcer patients frequently have been denied, become for months and even longer, the favored object of the gustatory explorations of these patients. Ulcer patients accustomed to a somewhat liberal intake of fat may lose weight after operation. With an eye to maintenance of optimal weights for a given height, patients who are below weight at the time of operation are cautioned that they continue a moderately liberal intake of fat, lest they lose weight. For the overweight patient, the new dietary allowances are particularly welcome.

Sealed occult perforation of a duodenal ulcer, in the experience of this clinic, is the most frequent cause of pyloric obstruction. Usually such obstructions relent on constant intragastric drip feeding of a high protein and carbohydrate fluid mixture (Varco gastric diet No. 2) permitting a one-stage resection.

The frequency with which benign and malignant ulcerative lesions are confused suggests the necessity of more frequent operation for gastric ulcer than has been common practice in the past decade.

The operation is to be done with care and deliberation. The experience of this clinic suggests that long operative procedures on patients well prepared for operation are well withstood. More notice should be taken by the surgeon of the length of the hospital stay and the total recovery period, with less emphasis on the length of time spent by the patient on the operating table. It is high time that the traditional interest of the surgeon

in the length of the operation, so important in pre-anesthetic days, be discontinued. In civil surgery there is no need for haste. The planned procedure in practiced hands affords the greatest promise of success.

The importance of employing short or no loop (jejunal) anastomoses in gastric resection for ulcer is pointed out. Spatial separation of the new gastric outlet from the site of entry of bile and pancreatic juice into the intestine by employment of a long jejunal loop invites stomal ulcer. Another probable effect of the same agency is diminution of absorption of secretin from the duodenal mucosa with decreased secretion of alkaline pancreatic juice with high buffer value containing sodium carbonate. On the thesis of Mellanby's consideration of bile as an additional alimentary stimulus for pancreatic secretions, it is suggested that excision of the gall bladder may prove of some value in combating the acid ulcer diathesis.

There are many things yet to be learned about the ulcer problem. It is becoming increasingly evident, however, that the acid-peptic digestive capacity of the gastric juice is the most important factor in the causation of ulcer. The magnitude of the problem of effective control of gastric acidity is real and frequently cannot be achieved consistently by available conservative means. Only operations which reduce effectively the gastric secretory capacity of the stomach have any place in the surgical management of ulcer.

Discussion

DR. R. T. LA VAKE (Minneapolis): I would like to ask Doctor Wangenstein a question. Several years ago I had a patient with preeclamptic toxemia who developed a continuous pain in the epigastrium. This is supposed to be a not uncommon symptom of late toxemia. This has not been my experience, however. Her internist, who had taken care of her from birth, felt sure that it was not a gastric or duodenal ulcer. After three weeks' treatment under hospital regime, labor began spontaneously at the beginning of the thirty-second week of pregnancy. She delivered a live premature infant very easily; but, while taking gas, she suddenly stopped breathing; but was finally resuscitated with artificial respiration, and went back to bed after delivery seemingly in excellent condition. Twenty-four hours later she developed pain and distension of the abdomen. Usual treatment for gas distension following delivery was instituted but to no avail; and she finally died.

Her internist felt that the diagnosis must be mesenteric thrombosis. An autopsy was granted, and general peritonitis from a ruptured duodenal ulcer was found.

When I was an intern at the New York hospital, it so happened that we had many perforating ulcers, and I thought that I would never in my life miss a perforation of an ulcer. Her abdomen was soft, not rigid. Were I to see another like case tomorrow, I would mistake the diagnosis.

Ever since this episode, I have wondered if we have been correct in our interpretation of epigastric pains in late toxemia. May it not be a sign indicating the advisability of x-ray gastro-intestinal studies? Certainly epigastric pain in late toxemia is not more frequently found than gastric and duodenal ulcer in nonpregnant women. Have you had any experience with perforation in pregnancy?

DR. O. H. WANGENSTEEN: The experience which Doctor La Vake relates is unusual. In the first place, we have been led to believe that an active ulcer during pregnancy is decidedly unusual. As a matter of fact, a search for substances in the urine of pregnant women

which would depress gastric secretion had its origin in the observation that remission from the symptoms of ulcer during pregnancy was frequent. In this connection, it may be of some interest to relate that my colleague, Doctor Lyle J. Hay, who is now abroad with United States General Hospital 26, was able to produce ulcers regularly by the histamine-beeswax method, in pregnant animals of several species. As yet, however, we have been unable to produce ulcers in the fetuses of such pregnant mothers in any species of animals by stimulating the endogenous gastric secretory mechanism by employment of the histamine-beeswax technique. This interesting paradox may suggest that there is no secretion of hydrochloric acid before birth by the stomachs of those species of animals injected. On the contrary, there are reported a few instances of spontaneous *in utero* perforation of gastric or duodenal ulcer in the human fetus.

The absence of abdominal rigidity in Doctor La Vake's patient is unusual. It is possible that the stretch of the abdominal muscles incident to pregnancy precluded the presence of rigidity. Ordinarily, however, pain and tenderness, both owing to the escape of a severe irritant, namely, gastric juice, into the peritoneal cavity, should have been present. Shock is a late phenomenon of perforation. Early after perforation, both pulse and blood pressure are unusually normal. It seems very odd that the usual symptoms of perforation should not have been in evidence. A roentgenogram with the patient in the left decubitus position, or sitting, would have been helpful. These films together with a scout film of the abdomen are often helpful in borderline acute abdominal lesions of any kind.

The meeting adjourned.

E. V. KENEFFICK, M.D.
Secretary.

Meeting of November 11, 1942

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 11, 1942. The meeting was called to order at 8:10 p.m. by the vice president, Dr. H. B. Zimmermann.

There were forty-two members and one guest present. Minutes of the October meeting were read and approved.

Dr. L. E. Daugherty read the following Memorial to Dr. Harry Parks Ritchie, a member and Past President of the Academy, who died on September 3, 1942. And a motion was carried that it be spread on the permanent records of the Academy and a copy sent to Dr. Ritchie's family with the condolences of the members of the Academy.

HARRY PARKS RITCHIE

1873-1942

Dr. Harry Parks Ritchie died September 3, 1942.

His father, Dr. Parks Ritchie, came to Saint Paul in 1881. He was one of the leaders in the medical profession and was a charter member of the Minnesota Academy of Medicine and its President in 1889. He was Dean of the University Medical School at a critical time in that institution's history—from 1897 to 1906.

Harry Ritchie attended the public schools in St. Paul and went to Yale where he was graduated in 1893. He then attended the University of Minnesota Medical School and received his degree in Medicine in 1896. He

taught physiological chemistry under Dr. Beard. His internship was served at the Ancker Hospital with Dr. Warren Dennis, Dr. Walter Ramsey, and Dr. Frank Warren. Shortly after serving his internship, he joined the 13th Minnesota Regiment and was in the Philippines during the Spanish American War. He was a Captain in the Medical Corps.

After the war he joined Dr. Archibald MacLaren and Dr. DeWitt and, after Dr. DeWitt's retirement, he remained with Dr. MacLaren and was associated with him for many years.

Because of his father, his whole life was spent in an atmosphere of medicine and his close association with such men as Drs. C. A. Wheaton, John Rogers, Robert Wheaton, John Rothrock, James Moore, Alexander Stone and MacLaren, and other leaders of that time, his opportunity was great and he made the most of it.

For many years Dr. Ritchie was Associate Professor of Surgery at the University and served that institution well and faithfully. While teaching at the University he became interested in plastic surgery and later in the repair of cleft palate and harelip. His work in this specialty was nationally known.

Dr. Ritchie read his Inaugural thesis at a meeting of the Minnesota Academy of Medicine on February 4, 1903. His subject was "Vaginal Section and Drainage for Suppuration in the Pelvis." He was elected Secretary of the Academy in 1920 and became its President in 1924.

It was my privilege to be associated with Dr. Ritchie for many years and his outstanding excellent characteristics are too many to mention. I do recall that I never heard him speak disparagingly of any one and this was particularly true of the medical profession. His love of children was sincere and great and I believe that the happiest days of his professional career were those spent in correcting their deformities.

His sons, Dr. Wallace Ritchie and Edwin Ritchie, are now with the armed forces of the United States Army.

L. E. DAUGHERTY, M.D.

MALIGNANT MELANOMAS OF THE UVEA AND THEIR PROGNOSIS

FRANK E. BURCH, M.D.
Saint Paul, Minnesota

The great preponderance of all intraocular tumors encountered in ophthalmic practice falls under the group of malignant melanomas of the uveal tract. They have been previously spoken of as sarcomas of the choroid. All are primary growths, about 80 per cent involving the choroid proper, about 16 per cent involving the ciliary body and choroid, and the balance originating in the iris itself. Metastatic sarcomas of the choroid are extremely rare. Gliomas are found only in childhood, are usually congenital, attaining growth as the eye grows from a 16 mm. to a 24 mm. length during the first eight years of life. Practically the only other intraocular tumor met with and then only rarely is a metastatic carcinoma from cancer of the breast, lungs, uterus, or elsewhere.

The incidence of sarcomas is approximately one in three thousand eye cases. The symptoms of beginning melanoma begin with impairment of vision if the posterior pole is involved or a scotoma in the field of vision corresponding to the site of the growth. The scotomas are usually enhanced by the development of retinal detachment in due time and one of the first considerations in study of retinal detachments is the exclusion of an underlying primary growth. As the melanoma increases in size, necessarily it encroaches upon the vitreous chamber or directly causes obstruction to circulation of intraocular fluids and induces glaucoma. If a glaucoma becomes intense it, in turn, may make the diagnosis of melanoma difficult. Thus it will be readily understood why, in cases of retina and fulminating glaucoma, one must ever bear in mind the possibility of an intraocular growth.

Doctor Camp and the author have endeavored to analyze all the histories of melanoma patients encountered at the University Hospital or in private practice, together with all the specimens submitted to our University Eye Laboratory for diagnosis. We have collected 113 histories and enucleated eyes. This analysis has had as its objectives: first, determination of the prognosis, not only in regard to melanomas in general, but also the prognosis according to the type of melanoma. As Dr. Camp will show you, there are five distinct types of intraocular malignant melanoma with variable prognosis dependent upon the type. A pure spindle-cell type affords a very excellent prognosis; on the other hand, the epithelioid type, the fascicular type and the mixed cell group are by no means so favorable as regards prospect for longevity. Our second objective in this research has been to determine the influence of irradiation upon the cytology and indirectly upon metastasis and prognosis in general. One of our further objectives is to determine the effect upon any migrating tumor cells in the orbit of post-enucleation irradiation. Fifty-three patients received postoperative irradiation. It will require a much longer follow-up of our cases to determine whether or not the insertion of radium in the orbit, or treatment with x-rays after enucleation, affords any insurance against local recurrence or development of metastasis. In any event, our melanoma ledger is now in shape to be continued for another decade or two by our department.

Melanomas of the uveal tract are not like melanomas elsewhere in the body. The prognosis for malignant melanomas in other parts of the body has never been considered favorable. Broders and McCarthy traced only four patients with five-year cures in seventy patients. Bloodgood reported only one five-year cure in over 200 malignant melanomas operated by him. In contrast to this, malignant melanomas of the uveal tract enjoy a relatively favorable prognosis. Pahwa, in a recent analysis of 100 cases seen prior to 1935, found that fifty-one were alive after five years. However, no age is exempt from metastasis or recurrence. In a case of Dr. Anderson Hilding's of Duluth, metastasis in the chest and recurrence in the orbit developed sixteen years after enucleation. If we could make biopsies before enucleation, we might be able to de-

termine the prognosis from type and fiber content with some fair degree of accuracy.

In our series of 113 cases, all but 94 were over forty years of age. Another factor influencing prognosis is the fact that many of these patients come when the tumor growth has already attained relatively large size, indicating a growth of many months. Frequently the history reveals that there has been impairment of vision over a period of one or two years. In thirty-five instances glaucoma is recorded. Sometimes the diagnosis is not made until the eyeball is sectioned following enucleation of an intensely painful, blind glaucomatous eye. So that doubtless, in nearly every case, when there has been plenty of time for metastasis to develop before a diagnosis of melanoma is made, or enucleation is done.

Even in some very small tumors we have found tumor cells within the lumen of vessels or extensions along emissary vessels and nerves. In five instances penetration through the sclera was noted. Altogether such microscopic extensions or macroscopic penetrations of the sclera are recorded in twenty-two of our series. Twice an undiagnosed melanoma was found on section of phthisical bulbs. With all these local extensions and penetrations of the sclera, it is noteworthy that actual recurrence in the orbit has developed in only six instances. It would seem obvious, therefore, that nature must provide some systemic resistance, or that tumor cells atrophy or undergo necrosis, or that some phagocytic or chemical destruction occurs locally as a means of preventing metastasis and local recurrence. Since acute or absolute glaucoma was recorded in over one-third of our series, which is indicative of an advanced stage of growth, one would expect such cases to be more likely to develop metastasis, or at least local recurrence; but, such is not the case. In only one of these glaucomas, many of which also showed evidences of tumor cell migration, has a secondary orbital growth developed to date, whether radium was inserted or otherwise, and in only eleven of the thirty-nine instances recorded has metastasis developed elsewhere.

It is conceded that all malignant melanomas are radio-resistant, or at least not radio sensitive. No attempt has been made to cure malignant uveal melanoma by irradiation. No evidence has ever been accumulated in ophthalmic literature to condemn prophylactic radiation therapy as a means of prevention of metastasis from intraocular malignant melanoma. McKee, Wood, and others have condemned its use as not only valueless but as actually harmful; that melanotic tumors are aggravated and metastasis favored by this line of therapy. R. Foster Moore and H. C. Stallard made attempts to treat melanoma of the choroid by implants of radium and radium sewed to the sclera over the tumor. We have attempted this in two cases and noted a shrinkage in the globe. Stallard concluded, "There is no doubt that for a time the neoplasm becomes more translucent and small. It is probable that some of the sarcoma cells are destroyed, and that these tumor cells treated by phagocytes are eventually absorbed by the blood vessels." Some twenty years ago we conceived the idea that by preliminary irradiation of intraocular malignant melanomas it might be possible to "sterilize" the growth,

so to speak, and then, by waiting until the full effect of irradiation was achieved, to enucleate the eye. Since most cases were seen when the growth was well developed, and opportunity for metastasis had probably existed for some months, we believed that a delay of four weeks, or thereabouts, until the full effects of irradiation were attained could probably afford only slight further opportunity for metastasis. Some cases were seen in which excellent vision was still maintained at the time of diagnosis. In others, the patient could not be reconciled to enucleation when the diagnosis and the prognosis was explained. In one notable case in which malignancy developed from a benign melanoma of the choroid observed by us over a period of thirteen years, the affected eye was the patient's only useful eye. Such cases as mentioned seemed favorable for prophylactic radiation therapy—if any cases were favorable.

In consultation with roentgen therapists, and we are especially grateful to Professor Stenstrom for his help in the matter, a fairly standard irradiation procedure was carried out at the University. A total dosage of 1500 roentgens, as measured by air, was employed in divided doses over a period of fifteen days. For the anterior field a 4 x 5 cm. and for the bilateral field a 4 x 6 cm. field was cross-fired in a series of thirty-five patients. In the main, a 200 kilovolt, 60 cm. target skin distance with a half millimeter copper filter for the anterior field and a one millimeter copper filter for the lateral field, was used. One millimeter of aluminum was always used as a secondary filter. Whenever possible the eye was not enucleated until one month after irradiation. Thirty-five cases were radiated, in most instances according to the above formula. Our study of the follow-ups and, more particularly, study of the effect upon cell structure by Doctor Camp, has failed to prove the value of radiation therapy in the treatment of intraocular malignant melanomas. Moreover, the results would seem to indicate that no one of the five cell types has responded to this form of therapy very favorably. This analysis, of course, does not include a very large series, but to us it has been sufficiently convincing. Perhaps over a long period of time follow-up data may alter our statistics slightly. That the dosage has been sufficient seems probable, because there have been several cases followed by contraction of orbital tissue—in a few, actual radium burns. Any effective radiation dosage (we must conclude) which might destroy tumor cells would damage healthy, adjacent tissues and the resistance which they naturally afford. If local adjacent cell resistance is damaged by an overdosage of x-rays or gamma rays, especially if local blood supply is impaired by their use, one might expect an unfavorable sequence.

Doctor Camp will enlarge upon this subject but, from our experience with prophylactic radium therapy for the purpose of arresting growth, preventing metastasis, and improving the prognosis, the conclusion is now very definite that this form of therapy is valueless. Whether or not irradiation immediately after enucleation, given for the purpose of preventing local recurrence or extension of tumor cells into the circulation accomplishes any purpose, will require longer observation of the

series in which it has been employed in order to determine the facts. As a result of our experience in this small group of cases, however, we must conclude that:

1. Even with intensive irradiation its action is uncertain in all types of malignant melanoma.
2. Roentgen therapy offers no assurance against metastasis; there is a bare possibility, when complete figures are available covering a longer period, that metastasis develops earlier after prophylactic use of irradiation than when it is not so employed.
3. Irradiation should be reserved for cases in which the tumor-containing eye is the only one retaining vision, for cases where the patient refuses enucleation, and those in which the tumor has already invaded the orbit and adjacent structures.
4. Early diagnosis and immediate enucleation remain of greatest value in prognosis.

PROGNOSIS OF MALIGNANT MELANOMATA OF THE UVEA FROM THE STANDPOINT OF PATHOGENESIS, CYTOLOGY AND FIBER CONTENT

WALTER E. CAMP, M.D.
Minneapolis, Minnesota

Probably no other group of tumors has given rise to as much controversy and argument in the matter of histogenesis or pathogenesis as has malignant melanomata of the eye. Since these tumors were first described as melanoses by Laennec in 1819, they have variously been classified as sarcomata (leuko-sarcomata and melano-sarcomata); endotheliomata; peritheliomata; chromatophoromata; melanoepitheliomata; and lastly, neuroblastomata or neuronevus, or tumors of neurogenic origin.

Our present concept is that these tumors of the uvea belong to a larger group of similar tumors, all of neurogenic origin. The origin of this class of tumors from the cells of the sheath of Schwann of the nerves, or of the nerve end organs was first shown by the work of Verocay (1910); by Harrison (1924) and Masson (1926-32); Laidlaw and Murray (1933); and lastly by Theobald (1937), the latter applying the findings of the previous writers to the eye, particularly the uvea.

Now that the problem of pathogenesis has been fairly well established, the pathologists have in recent years concerned themselves chiefly with a study of the prognosis of these growths.

In addition to the general rules of malignancy laid down by pathologists for all tumors, probably the most contributory studies on the prognosis of malignant melanomas of the uvea have been made by the cytological studies of Callender and the "fiber content" studies of Callender and Wilder.

Callender, in 1931, reported on 111 cases of malignant melanomas of the eye and classified them into

five groups on the basis of cell types and arrangement of cells.

The spindle cell is the most frequent of all cell types, forming the entire mass of some tumors and part of the so-called mixed cell type and fascicular type. It may be subdivided into:

I. *Spindle Cell A*

Spindle cells small, densely packed and seldom show a well-defined nucleolus—Tumor usually heavily pigmented.

II. *Spindle Cell B*

Larger spindle cells—fairly large chromatic nucleus with well-defined nucleolus—pigment moderate or slight in amount. These cells always are a component of the so-called mixed cell type and fascicular type to be described below.

III. *Epithelioid Type*

Large rounded or polygonal cells with chromatic nucleus and large nucleolus. Many cells multinucleated and occasionally quite large. Pigment usually moderate or slight. This type of cell is also found in the mixed cell type.

IV. *Fascicular Type*

Spindle shaped cells with a large nucleolus resembling Spindle B above and with occasionally rounded or polygonal forms. Cells arranged in columns or fasciculi—the long axis of the cell being at right angles to the column. The cells are arranged around a lymphatic or a blood vessel. Pigment is usually scanty, but occasionally may be abundant. This cell arrangement may also be found in the mixed cell type.

V. *Mixed Cell Type*

Usually most common type of cellular structure in malignant melanoma of the eye. A mixture of spindle cells and epithelioid cells with areas of fascicular arrangement. Some areas of tumor deeply pigmented; others devoid of pigment.

From an analysis of Callender's cases, he shows that the epithelioid type is most malignant; fascicular type next; then mixed; and lastly Spindle B and Spindle A.

If the prognosis of these cases of malignant melanomas of the uvea is compared to other cancers, i.e., a five-year cure, it will be seen that in class Spindle A, two of the eleven cases followed were dead in five years; in Spindle B, none of twenty cases that were followed; in the fascicular type, two of six cases (33½ per cent); in the epithelioid type, four of ten cases (40 per cent); in the mixed cell type, eighteen of fifty-five (32 per cent) of the cases followed.

At the University Hospital laboratory, we have studied ninety-seven cases of malignant melanoma of the uvea contributed from the Miller Hospital, University Hospital, and private physicians, who were kind enough to send in specimens for study. We have complete "follow-ups" on ninety of these cases.

They have been classified and studied similar to those of Callender, and we have the following results after a six-year period:

Classification	No.	Dead	No.	Cases	Per Cent
I Spindle A	1	1	8	12	
II Spindle B	6	29	20	20	
III Epithelioid	11	22	50	30	
IV Fascicular	6	9	66	25	
V Mixed Cell Type	7	29	25		

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As a further aid to prognosis, Callender and Wilder, with a modification of Foot's stain, were able to impregnate these tumors with silver salts to show an argyrophil reticulum. In a study of two hundred and five tumors, so stained, they classified them into three large groups depending upon their fiber content.

Group 1. Those having no fibers or fibers only in the interlobar stroma.

Group 2. Those having areas with and without fibers (combination of 1 and 3). This group subdivided into:

- (a) Tumors having a preponderance of fiberless areas.
- (b) Tumors having areas with and without fibers approximately equal.
- (c) Tumors having a definite preponderance of areas containing fibers.

Group 3. Tumors having fibers among the tumor cells throughout all areas.

In their group of two hundred and five cases studied, they have followed forty-six for a period of five years or more. The mortality of the various fiber groups are shown in the following table:

Class 1	100	per cent deaths
Class 2a	87	per cent deaths
Class 2b	76	per cent deaths
Class 2c	22	per cent deaths
Class 3	0	per cent deaths

In our series of ninety-seven cases, we have fiber stains, on twenty-nine cases that have been followed for a period of six years or more, and find the following mortality in six years in the various fiber groups:

Classification	No. Cases	No. Dead	Per Cent
Fiber Group 1	0	0	0
Fiber Group 2a	8	5	61
Fiber Group 2b	15	2	13
Fiber Group 2c	6	1	17
Fiber Group 3	None		

In comparing the various fiber groups with the cell type groups, it is found that of the total of eight dead, of twenty-nine cases after six years—two were Spindle B, one fascicular, three epithelioid, and two mixed cell types.

The greatest variation of our mortality in the various groups from that of Callender and Wilder is found in Group 2b, where we have only 13 per cent and they have 76 per cent. A larger series of cases would probably give more uniform results.

Discussion on Papers by Doctor Burch and Doctor Camp

DR. H. B. ZIMMERMANN, Saint Paul: I was much interested in the papers of Doctors Burch and Camp, especially their observations of the varying degree of malignancy observed in these tumors. More and more abdominal surgeons, by using silver impregnation techniques, have demonstrated that nerve sheath tumors are not at all uncommon in the abdomen and retroperitoneal space. As I understand Doctor Camp, he feels that he is able, in a measure, to determine the malignancy of Schwann sheath tumors of the eye by the richness of the collagen fibers as demonstrated by the silver impregnation stain. I do not recall that this observation has ever been made on intra-abdominal Schwann sheath tumors. If there are any pathologists present tonight, I wish they would discuss this point.

DR. ARNOLD SCHWYZER, Saint Paul: One cannot help being greatly surprised at the large number of cures Doctor Burch has had in melanomatous tumors. That is very different from what we see in general surgery. A man like Doctor Bloodgood of Johns Hopkins, with the large material there, had seen only one five-year cure. It must be we have some special conditions. Many may not be as malignant as in the rest of the body. One sees them early in the eye when they are still small; while the surgeon usually gets them when they are already of pretty good size.

When I saw the program, I hunted for the notes of a case I thought might be of general interest and also looked up the microscopic sections. The tumor cells had the appearance of epithelial tissue with large nuclei with little cytoplasm and no intracellular substance to be made out nor any cell membranes, only here and there a little connective tissue. The picture resembled mostly what Doctor Camp in his wonderful demonstration had shown as Class 4 of his cases. There was some pigment here and there, and macroscopically the growths were moderately melanotic.

The woman I speak of above, came to me in October, 1937, with a lump on her right arm. She had a little pain in it but said she knew that it was nothing serious. Her doctor had told her it was simply a fatty tumor. Then she had gone to a clinic a short while before I saw her. A biopsy had been done, and she had the report that it was benign. The tumor was the size of a small plum. It seemed like it was attached to the deltoid fascia underneath. I told the patient it was serious and excised the mass with much healthy fat surrounding it and also took along the fascia of the deltoid underneath.

Large doses of radium and x-ray were then given, and she stayed well until December, 1938, when she had an abscess in the midline above the promontory due to appendicitis. The appendix was removed and the patient recovered, but in February, 1939, she returned to the hospital with a hemoglobin of only 35 per cent and the stools black with blood. After massive transfusions, an x-ray showed she had a tumor in the stomach the size of a hen's egg rather far up on the greater curvature and posterior wall. The stomach was resected, and she then felt well until the summer of 1939 when the hemoglobin had again come down, and in August and October she received blood by transfusions. In October, on return from my vacation, I found a large mass in the mid abdomen and the stools again contained much blood. We had to resect about 18 inches of ileum together with the mesentery into which the growth had progressed. Again, it was a slightly melanotic, soft growth, the same in character as the growth on the arm and of the stomach. She felt well then for two years, but in October, 1941, was attacked by a sudden intestinal obstruction. Two loops of ileum were grown firmly together and through the slit in the mesentery another loop had become strangulated. These adhesions were undoubtedly remnants of her appendiceal abscess. Last spring she made us aware of a small tumor above the left knee which was excised and proved to be a simple fat necrosis—perhaps from a hypodermic. About two weeks ago she came to the office asking for some medicine because she did not want to grow too fat.

DR. FRANK E. BURCH, in closing: I am grateful to Doctor Schwyzer for giving us the general surgeon's experience as it relates to our subject. In considering prognosis, I wish some one could tell us what happens to these tumor cells when they wait ten or twelve years before they start secondary growth somewhere else; how they remain dormant; and why metastases develop so uniformly in the liver. Doctor Newton, of Dallas, Texas, in 1938 reported a case where a local recurrence came after twelve years, but without evidence of metastasis elsewhere. However, when I saw him recently and asked him about it, he said the patient died of metastasis in the liver a year later. He had a recurrence in the orbit after twelve years and after fifteen years developed metastasis of the liver.

I would like to compliment Doctor Camp for the tremendous amount of work he has done in classifying these tumors and for the painstaking work he has done in examination of sections to find out the influence of "fiber content" on malignancy and its relation to prognosis.

DR. WALTER E. CAMP, in closing: I want to compliment Doctor Burch for his untiring efforts in following up these cases; there has been a great deal of work to it. I also want to compliment Mr. Morris on his fine color photography of these slides.

Dr. Arnold Schwyzer, of Saint Paul, read a paper on "White Bile." This will be published in full, separately.

The meeting adjourned.

E. V. KENEFICK, M.D.

Secretary.



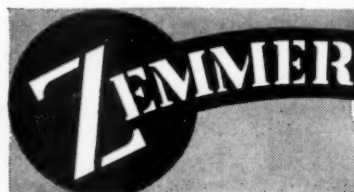
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IN MEMORIAM

In Memoriam

HIRAM J. LLOYD

Dr. Hiram J. Lloyd, a well known citizen of Mankato and a member of the Mankato Clinic, died December 14, 1942, following a period of ill health for nearly two years.

Hiram Lloyd was born on December 31, 1876, near Judson in Butternut township. He taught school for a number of years before studying medicine at the Chicago College of Medicine and Surgery where he received his medical degree in 1910. After serving an internship in Chicago for a year he began the practice of medicine at Lake Crystal in 1911. Five years later he opened an office in Mankato where he practiced continuously except for a period of service in the army medical corps in 1917 and 1918. After a year overseas he returned to Mankato.

Before studying medicine Dr. Lloyd was in charge of music at the Moody Institute in Chicago. He was endowed with a fine tenor voice and conducted a number of musical organizations in Mankato. Among these were the Mankato Orpheus Club, the Ladies Glee Club and the choir of the Welsh Presbyterian church. He also sang in the choir of the First Presbyterian church for about fifteen years.

One of the outstanding musical events of the community was the oratorio "Elijah" presented in 1927. On other occasions "Creation" and "The Messiah" were rendered under his direction.

Dr. Lloyd was a member of the American Legion, the Disabled War Veterans, Veterans of Foreign Wars, the Masonic Lodge, Knights Templar, Kiwanis Club and was a member of the Blue Earth Medical Society, the Minnesota State and American Medical Associations. He was a member of the Welsh Presbyterian church where in 1935 he organized the present church choir and directed it for a number of years.

On November 9, 1904, he married Margaret Jones and last year their anniversary was celebrated at St. Joseph's Hospital, where he was a patient, with a reception for his many friends.

Dr. Lloyd is survived by his wife; two sisters, Mrs. Margaret Lloyd Davies, Mankato; Mrs. John B. Jones, Lake Crystal; and two brothers, John Reese Lloyd, Palo Alto, California; and Elias Lloyd, Monticello, Florida.

OLE SAMUEL SWENNES

Dr. O. S. Swennes of Wahkon, Minnesota, died suddenly of a heart attack December 20, 1942, at the age of seventy-five.

Dr. Swennes was born March 12, 1867, in Barre Mills, Wisconsin. He received his Bachelor of Arts degree from Luther College in Decorah, Iowa, in 1891. His medical degree was obtained at Rush Medical College in Chicago in 1894. After practicing at Northfield and Milaca, in 1898 he moved to Wahkon.

In 1904 Dr. Swennes was married to Severa M. John-

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GYNECOLOGY—Two Weeks' Intensive Course starting April 5; Clinical and Diagnostic Courses.

OBSTETRICS—Two Weeks' Intensive Course starting April 19; Informal Course.

OPHTHALMOLOGY—Two Weeks' Intensive Course starting April 5.

OTOLARYNGOLOGY—Two Weeks' Intensive Course starting April 19.

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son. He is survived by his wife and three children, Ordway and Mrs. Alvin Mann (Mildred) of Washington, D. C., and Telford of Atlanta, Georgia.

Until recently Dr. Swennes was a member of the East Central Medical Society, the Minnesota State and American Medical Associations.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR FEBRUARY

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Saturday morning over Station WCCO, Minneapolis and St. Paul, and at 11:30 o'clock over Station WLB, University of Minnesota. Speaker: William A. O'Brien, M.D., Director of Post-graduate Medical Education, Medical School, University of Minnesota.

February 6—Rheumatic Fever—Signs and Symptoms

February 13—Rheumatic Fever—Diagnosis

February 20—Rheumatic Fever—Treatment

February 27—Focal Infections

E. STARR JUDD LECTURE

Dr. Alfred Blalock of Baltimore, Maryland, Professor and Director of the Department of Surgery at the Johns Hopkins Hospital, will give the tenth E. Starr Judd lecture at the University of Minnesota in the Museum of Natural History Auditorium on Thursday, March 11, 1943, at 8:15 p.m. The subject of Dr. Blalock's lecture is "Traumatic Shock with Particular Reference to War Injuries."

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

The regular meeting of the Minnesota Society of Neurology and Psychiatry was held at the Town and Country Club, Saint Paul, Tuesday evening, January 12, 1943, following dinner.

The program for the evening consisted of a paper by Dr. Walter P. Gardner of Anoka entitled "Pulmonary Tuberculosis at the Anoka, Minnesota, State Hospital, 1934-1941."

Officers elected for the coming year are: President, Alfred W. Adson, M.D., Anoka; vice president, Walter P. Gardner, M.D., Anoka; secretary-treasurer, Royal C. Gray, M.D., Minneapolis.

WINONA COUNTY MEDICAL SOCIETY

Dentists of Winona County were guests of members of the Winona County Medical Society at the annual meeting held in Winona, Monday evening, January 4, 1943, when Dr. E. D. Risser presented a paper on "Blood Banks and Blood Transfusions," covering special studies he recently completed in an extension course at the University of Minnesota.

Officers elected for the coming year included: President, E. D. Risser, M.D.; vice president, Victor Bruder, M.D.; secretary, A. E. Meinert, M.D.; treasurer, R. H.

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◆ Of General Interest ◆

Dr. Paul B. Monroe, formerly of Two Harbors, has established his practice at Cloquet, where he has joined the staff of the Raiter Hospital.

* * *

Dr. R. C. Radabaugh of Hastings has received notification of his acceptance to fellowship in the American College of Surgeons.

* * *

Dr. and Mrs. Demeter Kalinoff of Stillwater and daughter, Helen, left recently for an extended stay in Arizona, or New Mexico or wherever the climate best suits them. They are traveling by automobile.

* * *

At the annual meeting of the staff of St. Luke's Hospital, Saint Paul, on Friday, January 15, 1943, Dr. A. P. Gruenhagen was re-elected chief-of-staff and Dr. D. L. McCain was elected secretary.

* * *

Dr. W. R. Humphrey, Stillwater, returned in December from a five weeks' visit in the East, principally in Virginia, his home state. Returning, he attended the Interstate Post-Graduate Assembly of North America meeting in Chicago.

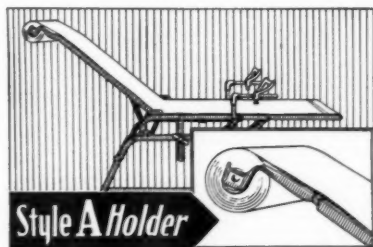
Dr. J. Gordon Cole of Redwood Falls has accepted a position on the staff of a New York hospital for the duration of the war. He expects to return to his practice in Redwood Falls when his services are no longer needed in the East.

* * *

Dr. Cecil J. Watson, professor of medicine and chief of the division of internal medicine, Medical School, University of Minnesota, in December delivered three addresses before the Porto Rico Medical Society. He spoke in Ponce, P. R., on the anemias, hemoglobin metabolism and bile pigments.

* * *

The Foundation Prize of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons consisting of \$150.00 is open to interns, residents or graduate students in obstetrics, gynecology or abdominal surgery and to physicians practicing or teaching this specialty. Manuscripts are limited to 5,000 words and should be submitted by June 1, 1943, to Dr. James R. Bloss, secretary, 418 Eleventh Street, Huntington, West Virginia.



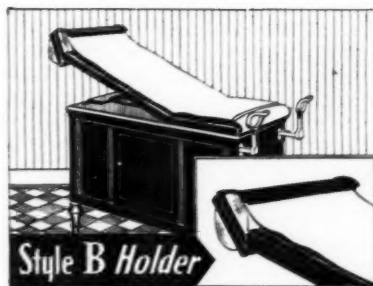
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Dr. R. V. Williams of Rushford retired from practice the latter part of December and announced that his associate, Dr. I. Grant Davis, will continue the practice of medicine in the community. Dr. Davis recently completed a special course in refraction at the Illinois Eye and Ear Infirmary at the University of Illinois and will take care of the refraction work formerly done by Dr. Williams.

* * *

Dr. Ernest M. Hammes, chairman of the Medical Testimony Committee of the Minnesota State Medical Association, addressed the joint meeting of the Congress on Industrial Health and the Congress on Legislation of the American Medical Association at their meeting in Chicago, January 11 to 13, 1943, on the subject of the Control of Medical Testimony—The Minnesota Plan.

* * *

During the current quarter 140 medical and dental officers of the Army, Navy, Public Health Service and the Air Forces are assigned through the Surgeon Generals' offices and the various Service Commands for training under the auspices of the Mayo Foundation for Medical Education and Research. The fields in which such training is offered are anesthesiology, aviation medicine, general surgery and surgical specialties, internal medicine and medical specialties, maxillofacial surgery, neurologic surgery, physical medicine, roentgenology and thoracic surgery. Officers are assigned for

periods of training varying from six to twelve weeks.

* * *

A portable orthopedic fracture bed will be purchased with funds to be raised through the efforts of the Wells Junior Chamber of Commerce, according to an announcement made last December. The bed will be available for use of residents in the following towns and surrounding communities: Wells, Brycelin, Delavan, Easton, Frost, Kiester, Walters, Conger, Mansfield, Manchester, Armstrong, Alden, Hartland, Freeborn, Minnesota Lake, Mapleton, Waldorf, Matawan, and New Richland. The bed will be readily available to any physician in the listed areas, should an emergency arise.

* * *

Creation of an additional home for the feeble-minded "at the earliest possible moment," due to the tremendous waiting list of patients badly in need of removal from their present surroundings, was recommended by Dr. D. E. McBroom, director of the mental health unit of the division of public institutions, in his report to Carl H. Swanson, public institutions director, who submitted his biennial report to Gov. Harold E. Stassen and the state legislature in January.

"The feeble-minded problem is perhaps the biggest individual problem the state has to meet as we have a long waiting list and so many patients are creating a situation so bad they should be removed from their surroundings at once," Dr. McBroom urged.

MINNESOTA MEDICINE

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Hospital News

Dr. George E. Penn was elected president of the staff of the Immanuel Hospital, Mankato, at the meeting of staff physicians in January. Other officers chosen at the meeting were Dr. A. F. Kemp, vice president, and Dr. J. A. Butzer, secretary-treasurer.

* * *

Dr. P. G. Boman is the new chief of staff of the Miller Memorial Hospital at Duluth. He succeeds Dr. Carl O. Kohlbray. Other officers are Dr. E. L. Armstrong, vice chief of staff; and Dr. E. E. Barrett, secretary-treasurer. Dr. Kohlbray and Dr. W. J. Ryan were named to the Executive Committee.

* * *

Dr. Jean J. Darius of Lame Deer, Montana, began his duties as senior physician at the Indian Hospital in Bemidji, late in December. He succeeds Dr. James Klock, who recently resigned to take up duties elsewhere.

* * *

St. Mary's Hospital, Detroit Lakes, was recently the recipient of an oxygen therapy machine donated by the American Legion of Detroit Lakes.

* * *

Mrs. Alma Grothe is the new superintendent at St. Francis Hospital, Hastings, succeeding Mrs. Wallace H. Erickson, resigned. Mrs. Grothe is a graduate of St. Luke's Hospital, Fargo, North Dakota. Prior to taking the position at St. Luke's Hospital, she was instructress of nurses at Hillcrest, Minneapolis, for three years and superintendent of a hospital in Sioux Falls, South Dakota, for some time.

* * *

Physicians in Military Service

Dr. Harold S. Diehl, dean of the Medical School, has recently received word of military honors bestowed on three medical officers who are graduates of Minnesota.

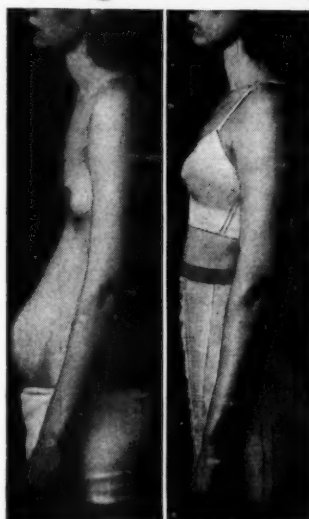
The Distinguished Service Medal of the Army was given to Col. James O. Gillespie of the Class of 1925 for work in developing hospitals in Bataan during its siege. Col. Gillespie is now a prisoner in the Philippines.

Captain William W. Moir, Class of 1938, received the Distinguished Service Cross for continuing to direct treatment of his men after he had been wounded when a transport plane in which he was traveling was shot down the morning of Nov. 8. "During the attack in the air and ensuing strafing of the ground, Moir distinguished himself by extraordinary heroism," his citation concluded.

Lieut. John H. Peterson of Duluth, a graduate of the University of Minnesota Medical School in 1932, was awarded a Silver Star medal recently, according to a Navy announcement. Stationed on the destroyer *Hammann* when it was sunk with the aircraft carrier *Yorktown* off the Midway Islands some months ago, Lieutenant Peterson struggled to a lifeboat after the destroyer was sunk and with the help of a torpedoman picked up wounded seamen. Although both were wounded, they made several rescue trips to take wounded men to a nearby destroyer and rendered medical aid to the wounded for three days to the point of exhaustion.

FEBRUARY, 1943

Patients with Long-Standing Ptosis



A

B

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For service look in telephone book under "Spencer Corsetiere" or write direct to us.

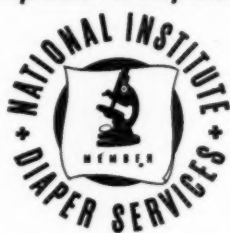
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Dr. W. F. Schamber of New York Mills left for Miami, Florida, in January to report for military duty.

Dr. Conrad Karleen of Tracy, associated with Dr. W. H. Valentine and the Tracy Hospital for the past two years, has received his commission as captain in the medical corps and is now in Springfield, Missouri, where he is stationed at O'Reilly General Hospital, serving in the capacity of surgeon.

Dr. Bernard Karleen of Balaton, a brother of Dr. Conrad Karleen, has entered the Army Medical Air Corps at Miami, Florida.

* * *

News of Minneapolis physicians engaged in war service contains the following items:

Dr. George Bergh has been promoted to the rank of major, according to information received by his parents, Dr. and Mrs. L. N. Bergh of Montevideo. Dr. Bergh is serving with the American Expeditionary Forces overseas.

Captain Henry H. Michel has been ordered to duty with the Army Air Force at Miami Beach, Florida.

First Lieutenant Fabian John McCaffrey is under orders to report to Army Air Force station at Miami Beach early in February.

Lieutenant Commander John F. Pohl has been ordered to report to the National Naval Medical Center, Bethesda, Maryland, February 15.

Lieutenant Commander Lawrence M. Larson who has been commanding officer of the Naval Hospital, Wold Chamberlain Field, is now en route to some undisclosed point in the South Pacific to serve as Flight Surgeon with a Marine aviation unit.

Lieutenant Commander Hugo E. Miller is receiving congratulations on his recent promotion. He has been relieved from duty with recruiting and assigned to the Naval Hospital, Seattle.

Captain William W. Moir, Jr., DSC, son of the late W. W. Moir, has received the Order of the Purple Heart. He was wounded and decorated for gallantry in action in North Africa.

Major Donald W. Pollard has been assigned to administrative work at the Kennedy General Hospital, Memphis. This is a new hospital which is being expanded rapidly.

Major William J. Noonan has been transferred from Fort Leonard Wood to the 126th Station Hospital, Camp Grube, Oklahoma.

Captain Benjamin J. Palen is now taking graduate work in surgery at Harvard Medical School, following which he will return to the Station Hospital, AAF Bombardier School, Big Spring, Texas.

Captain Harold G. Benjamin is reported to have been sent to an overseas theater of war.

Lieutenant Maynard C. Nelson is reported en route to a post in the South Pacific.

Major Reuben Berman has been transferred to the 14th Bomb Wing, stationed at McDill Field, Florida.

BOOK REVIEWS

INFLUENZA—PNEUMONIA—ENCEPHALITIS THE STATE BOARD ASKS YOUR AID

Influenza.—Two types of influenza are known at present, "A" and "B". The distribution and extent of infection with these two viruses may be determined through your aid.

Pneumonia.—Recently there has been much interest in so-called atypical or virus pneumonias. Very little is known of their etiology. The Division of Preventable Diseases wishes to study these diseases and asks your aid. The Rockefeller Foundation for some years has aided the Division of Preventable Diseases in the study of Influenza and related diseases. But the expense and the time-consuming technique necessary have restricted the studies chiefly to institutional outbreaks.

New serological techniques have been devised that are rapid and inexpensive. Neutralization tests on sera to determine a rise in the antibody content of convalescent serum as compared with serum taken during the first two or three days of illness will establish diagnosis.

Mailing outfits will be supplied, on request, by the Division of Preventable Diseases. The first serum specimen is to be taken on the first two or three days. The sera for comparison of antibody content in suspected influenza ("A" or "B") between the tenth and fourteenth day after onset.

Encephalitis.—In suspected encephalitis of the equine and St. Louis types, the later specimens for comparison of antibody content should be taken two to six weeks

after onset, and in lymphocytic choriomeningitis, from the second to the fourth month after onset.

Health officers and physicians in contact with outbreaks of this character and physicians who see suspected cases, will please coöperate.

MENINGITIS MORE FREQUENT

Many more cases of meningococcus meningitis are being reported by state health officers to the U. S. Public Health Service each week than have been reported at this season any time in the last five years.

During the year just ended (1942), there were 3,774 cases reported altogether. This is a larger total yearly figure than any year since 1937, when there were 5,390 cases.

At present, and for some time past, the cases have been confined to the extreme eastern part of the country and the Pacific coast.—*Science News Letter*, January 30, 1943.

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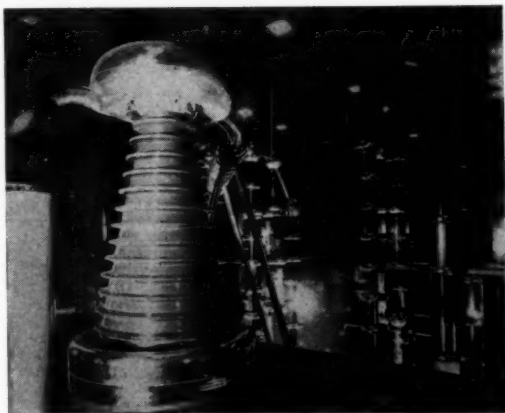
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BOOK REVIEWS

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

MENTAL ILLNESS: A GUIDE FOR THE FAMILY. Edith M. Stern, with the collaboration of Samuel W. Hamilton, M.D. 134 pages. Price, \$1.00, cloth. New York: The Commonwealth Fund, 1942.

THE EYE MANIFESTATIONS OF INTERNAL DISEASES. I. C. Tassman, M.D. 542 pages. Illus. Price, \$9.50. St. Louis; C. V. Mosby Co., 1942.

This is the first book of this character since that published by Foster Moore ten years ago. A correlation is made between the eye manifestations and the other medical aspects of the internal diseases by providing a very detailed description of the ocular findings. The first few chapters are devoted to a description of the normal and abnormal structures of the eye, together with a description of the method used in making a complete ocular examination of the patient, and a listing of the general causes of eye manifestations.

The remainder of the book has to do with congenital and hereditary eye manifestations; infections and infectious diseases; tuberculosis; virus infections; fungus infections; ocular parasites and parasitic infec-

tions; focal infections; drug and chemical intoxications; diseases of the cardio-vascular system; diseases of the blood; diseases of menstruation and pregnancy; diseases of the endocrine glands and metabolism; avitaminosis and intracranial tumors; diseases of the skin; diseases of bones of the skull.

Obviously, this is a rather complete presentation dealing with systemic lesions. The clinical picture is given first and this is followed by the ocular manifestations. This book, I think, is suitable for the teaching of the student who should be impressed with the relationship of ophthalmologic diseases to general medical conditions.

T. J. EDWARDS, M.D.

THE ANSWER IS—YOUR NERVES. Arnold S. Jackson, M.D. 1942. 200 pages. Price \$2.00. Madison, Wisconsin: Jackson Publications.

Individuals who suffer from functional disturbance constitute the greater part of the practice of most physicians. Most of these patients in the stress of modern living and particularly during this period of world strife are beset by worries and fears of various sorts and are lacking in a philosophical attitude toward life and in religious faith. They haven't learned how to live.

For this large group of patients this volume has been written. It contains some medical information which should be of value to the nervous patient in aiding him or her to understand some of the dis-

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BOOK REVIEWS

turbances which account for nervous symptoms and does not ignore the importance of seeking medical advice instead of worrying.

The pages contain much philosophical advice and many hints as to hobbies and outside interests which make life so much more interesting and counteract the causes of "nerves." The chapter by the Reverend Edwin O. Kennedy of Madison on Religion and Nerves stresses the value of faith in a loving God, Bible scripture and church attendance in combating worry and nerves and is a valuable contribution to the volume.

Physicians too often neglect the opportunity to be of greatest assistance to these patients who suffer from just nerves. For this reason the reading of "The Answer IS—Your Nerves" would be of value to physician or surgeon. And the loaning out to patients of one or more copies might well fulfill one of the purposes of the book—to aid the doctor in treating his nervous patients.

C. B. D.

THE BLOOD BANK AND THE TECHNIQUE AND THERAPEUTICS OF TRANSFUSIONS. R. A. Kilduffe and Michael DeBakey. 558 pages. Illus. Price \$7.50. St. Louis: C. V. Mosby Co., 1942.

The recent work done in the field of blood transfusion has reached tremendous heights. Of course the present war has stimulated this branch of therapy and the average physician has had difficulty in keeping abreast of the topic. This book should be an answer to his problem. It is concise but still retains a completeness that leaves the reader with a sense of "knowledge security."

The principles of transfusion are adequately discussed and the practical aspects are satisfactorily described. The diagrams and illustrations enable the reader to easily grasp the expressed idea with little effort.

The discussion of shock and its treatment is especially well done by the authors.

The book is not one that can be read hurriedly, because in doing so, much valuable information would be missed.

JOSEPH M. RYAN, M.D.

THE MIND AND ITS DISORDERS. James N. Brawner, M.D., Medical Superintendent, Brawner's Sanitarium, Smyrna, Ga. Cloth. Price \$3.50. Pp. 228. Atlanta, Ga.: Walter W. Brown Publishing Co., 1942.

Dr. Brawner, in the preface to his volume, "The Mind and Its Disorders," states that he is writing primarily for the benefit of the general practitioner, and that his intention is to present the subject clearly, briefly, and in language as simple as the subject permits. To the reviewer, it would seem that he had been too successful in accomplishing this purpose. The work covers a wide variety of neuropsychiatric disorders, too many to be described adequately in the brief space he allots to each condition.

The book is simply written and easily read. The reviewer feels that its style and simplified form may convey to the reader an underestimation of the impor-

This New Book Will Save Consultation Time THE ANSWER IS . . . YOUR NERVES

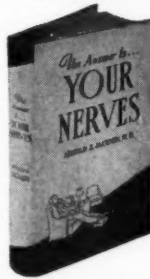
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BOOK REVIEWS

tance and extent of care psychiatric cases require. The paragraphs on etiology are over-simplified and are apt to leave the impression that the causes are well defined and understood. The sections on treatment are brief. Symptomatic treatment is suggested in most instances and the basic principles of treatment are briefly outlined, but little actual aid or advice for handling a neuropsychiatric case is given. The book is especially weak as far as suggested technique and principles of psychotherapy are concerned. The paragraphs on symptoms are more complete and the diagnosis and differential diagnosis are adequately handled in most instances.

For a busy general practitioner, and one not particularly interested in statistics and classification, Dr. Brawner has presented his material in what seems to be an understandable and logical manner. At the end of the various sections in the book is a bibliography, which in places is very complete. This greatly increases the value of the book for those interested in pursuing the subject further.

Throughout the entire book, the author freely states his own personal experiences, opinions, and conclusions. Many of his speculations would certainly be open to question and all have not, as yet, been verified by research. He does, however, give due recognition to others who have different ideas on the subject.

Dr. Brawner is to be commended for his able handling of the interrelationship between internal medicine and psychiatry. He brings out this connection logically and clearly through the entire book. The effect of emotions on bodily functions, and vice versa, is briefly outlined, explained and well organized. This particular section, Part I—The Mind as Related to Cerebral Structures and Functions, will give the general practitioner a good basic introduction to the subject and will help to orient him, should he desire to seek more complete discussions on the subject elsewhere.

If the book is considered by the reader as a stepping stone to more complete works on the subject of psychiatry, it is well worth reading. The average physician, however, will find it does not answer his questions nor solve many of the problems that arise in his care of a neuropsychiatric patient. Dr. Brawner's book, because of its simple terms and brevity, could be used to advantage as a reference book for nurses in their preliminary orientation course in psychia-

try. Even in this use, it would have to be supplemented by other books which deal with psychiatric nursing technique.

PHILIP K. ARZT.

INDUSTRIAL HEALTH

(Continued from page 204)

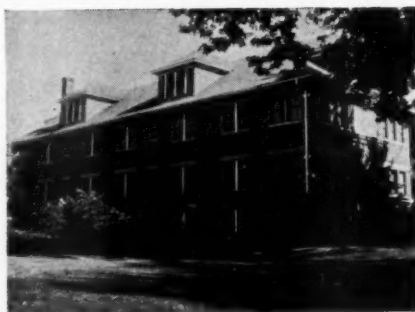
placement examination is a device to select only perfect human material to the elimination of all applicants who exhibit any physical defects. Such is, indeed, not the case. If it were, not only would the social loss be great, but the pre-placement examination would lend itself to the perpetration of a cruel and inhuman discrimination.

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"There are functions of the pre-placement examination, furthermore, which are in a sense incidental to the main purpose for which it is made. One of these is recognition of remediable defects. It is good practice to acquaint the applicant with these defects and then to urge the immediate correction of certain defects either as a condition of employment or as a condition of acceptance for an insurance program."

Tendency Is to Employ Disabled

"The pre-placement examination is not given for the purpose of rejecting applicants," he emphasized again in conclusion. A few are unemployable because of infectious tuberculous or luetic disease, for instance. But the whole question is one of the man and the specific job he is to do and rejection for one given position does not necessarily mean that a man is unemployable. Aside from this emergency, the tendency of industry is rightly to employ men with disabilities which are not potential hazards to themselves or to fellow workers."



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